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ABSTRACT

An investigation of learning styles was jointly conducted by the Fox Valley Technical Institute and the Center for Vocational Technical and Adult Education at the University of Wisconsin at Stout. After a study of learning styles, a computerized model to manage an instructional system was developed. Analysis of information necessary to manage a learning-styles-based instructional system was used to develop a model consisting of learner-instructor-computer interactions. A series of computer programs written for a time-sharing system were designed according to the model, and the computer management system was tested using a basic physics program. (CH)

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Final Report

Sub-Project to Fox Valley Technical Institute (VTAE District 12)
Project No. 12-103-151-224

Allen Hilgendorf, Director

Center for Vocational, Technical
and Adult Education

University of Wisconsin-Stout
Menomonie, Wisconsin

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INVESTIGATING THE INTERACTION OF LEARNING STYLES AND TYPES OF LEARNING EXPERIENCES AND ASSESSMENT OF THEIR IMPACT ON LEARNING IN POST-SECONDARY VOCATIONAL-TECHNICAL EDUCATION PROGRAMS: PHASE II

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August 14, 1974

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I. INTRODUCTION

Summary

A learning styles project jointly proposed by Fox Valley Technical Institute, District 12, and the Center for Vocational, Technical and Adult Education at UW-Stout was funded by the Wisconsin Board of Vocational, Technical and Adult Education. During the 1972-73 academic year the University of Wisconsin - Stout sub-contracted with FVTI to conduct a portion of the research for the first phase of the learning styles project. (Banks, 1973) The second phase of that sub-contract involved the development of a computerized model to manage an instructional system in which information about student's preferred style of learning would be considered in prescribing learning activities corresponding to that style.

A model schema consisting of learner-instructor-computer interactions was developed by analyzing the types of information necessary to manage a learning styles based instructional system. A series of computer programs written in BASIC for the PDP-11 time-sharing system were designed according to the model logic. (The model could also be used to develop similar programs in other languages.) The computer management system was tested using the modules and alternative learning activities constructed for a basic physics program at UW-Stout.

The system performed all expected management processes and output unique learning prescriptions based on learning styles. A complete evaluation system was included in the model, however due to insufficient time and input data, that component was not tested.

Instructors who analyzed the system agreed that the management component would be useful or necessary to manage a modularized instructional system. Several instructors and administrators who reviewed the system expressed concern over the procedure used to relate the learning activities to learning styles and recommended a more systematic approach to that process.

Rationale

Individualized instruction is recognized as an educational approach necessary to provide for the many individual differences that exist among students. This need to provide individualized instruction is suggested in learning theories and is the focus of much current educational research.

Although the need for providing individualized instruction has been recognized, some basic problems tend to deter its implementation. One of those problems involves the handling of large amounts of information connected with managing a system in which each student may be at different points in the course and require different materials to learn a given concept or skill.

Computerized systems are now available to help with all levels of this management task. By maintaining student records on a computer storage device and by continually monitoring a student's progress via on-line terminals, the teacher has access to daily progress reports. More sophisticated systems can provide a more detailed analysis of students' progress, suggest assignments and conduct on-line evaluation. With the present availability of moderately priced time-sharing equipment, the previously difficult bookkeeping problem involved in managing individualized instruction appears to be diminishing.

As the management of individualized, prescriptive, instruction becomes feasible another more fundamental problem concerning the criteria used to prescribe instruction must be considered. Learning style has been under investigation recently as a variable which tends to interact with various modes of instruction. As more evidence of this interaction becomes available, it appears that a computerized management system can be used, in fact, will be necessary, to prescribe those learning activities which best match the learning styles of the learner.

Problem

This project was part of a more comprehensive project involved with identifying learning styles of students and assessing their impact on learning in the post-secondary vocational-technical education program. (Oen, 1973) The problem for this sub-project was to develop a model for the computer logic required to store, summarize and retrieve the student and instructor information required to manage a learning styles based individualized instructional system.

Objectives

The specific objectives for this sub-project were to:

1. Develop a list of the information teachers and students need in order to manage and function within a learning styles based individualized instructional system.
2. Design an instructional information system model.
3. Identify the computer program logic, inputs and outputs required for the instructional information system.
4. Determine the feasibility of an on-line interactive terminal system for input and output of the instructional data used in the instructional information system.

II. REVIEW OF RELATED LITERATURE

In a review of research on computer-based instructional management systems, Baker (1971) briefly described several of the earlier management systems. Although each system described by Baker was designed to manage a unique instructional program, all systems included some degree of test scoring, diagnosing, prescribing and reporting. Also, each system incorporated a similar basic model and curricular approach. Objectives within a subject matter area were grouped into instructional units. Pretests were used to determine students' present level of achievement and aid in prescribing instruction. Post-tests were used to determine whether objectives were achieved and detailed computer generated reports were always available to aid teachers in the diagnosing and prescriptive process.

In summarizing his report, Baker indicated that although the reporting aspects of the systems were reported in detail, the procedures for diagnosis and prescription were vague or completely lacking. Baker continued to discuss the problem of prescriptive capabilities of the various systems emphasizing the need for better diagnostic and prescriptive procedures. He concluded that considerable applied and theoretical work was needed on procedures for diagnosing and prescribing in order to develop them to a level adequate for CBIM and CAI systems (Baker, p. 64).

The use of various forms of diagnostic learning prescriptions appear to be promoted by an increased use of computer generated tests. Franklin Prosser and Donald D. Jensen (1971) describe an extensive computer generated testing program at Indiana University in which students are permitted to keep the tests after they have turned in their answers. The students are then given the correct answers in return for their completed answer cards. This provides students with immediate feedback of results along with materials in the form of test questions for further study.

Descriptions of several existing computer generated testing systems include references to various ways in which test results are used to provide prescriptive feedback. Dudley (1973) describes a system in which a listing of the items missed, showing both the student's answer and the correct one, together with a reference to the course material is printed for the student. Hsu and Carlson (1973) use a separate program to print out exercise pages for missed objectives. Libaw (1973) described the MENTREX system which provides individual tutorial feedback and references to specific information sources to reveal what his test reveals that he has not yet learned.

Perhaps the most comprehensive work involving systematic prescriptive capabilities based in learning styles has been done by Dr. Joseph E. Hill (1971) at Oakland Community College in Bloomfield Hills, Michigan. Hill uses cognitive style mapping to obtain a profile of students cogni-

tive styles. That information can then be used to predict which learning activities would be best suited for each student.

III. METHODOLOGY AND PROCEDURE

This project of constructing a learning styles based management system was undertaken in conjunction with another project in developing learning styles based curricular materials in the UW-Stout Physics department. The physics project dealt primarily with modularizing several basic physics courses and designing various alternative learning activities keyed to the objectives. Since the director of the learning styles project was also involved in the physics project, most of the initial testing of the computer programs utilized data which were generated for the physics project. The physic modules were designed for students in technical programs; thus, many of the modules would be appropriate for vocational-technical schools.

Descriptions of the method and procedure for each activity as listed in the project proposal are as follows:

Activity #1.

> Using a nominal group approach, determine the instructional information and computer-output data needed by teachers and students in order to create an effective learning environment.

To identify the information involved with managing a learning system the director of this project worked closely with the following

people:

a) Dr. Orville Nelson, Research Specialist
Center for Vocational, Technical and Adult Education

b) Dr. Steve Fossum, Associate Professor, Physics

c) Dr. Mark Larchez, Assistant Professor, Physics

In individual consultation, Dr. Nelson provided the initial information used in outlining the project and identifying the limitations or boundaries of the information sought. His information was based on meetings with staff at FVTI and involvement in Banks (1973) project. Then, over a period of a few weeks, the director met regularly with Dr. Fossum and Dr. Larchez to discuss what specific information was necessary to develop an individualized instructional system based on learning styles. The information identified was classified according to whether it was associated with students or subject modules, and later formed the two major files in the management system. (See Appendix A)

Activity #2.

Create an instructional information system model.

The information system model was developed by first identifying activities required of instructors and students in a learning center environment where learning activities are prescribed according to individual styles of learning. Next, those activities such as generating learning prescriptions, record keeping, reporting and evaluation were

selected for inclusion in the basic model. The procedures dictated by those activities were then flow charted and integrated to form the system model.

Fundamental to the model is the role of the system as an extremely efficient instructor's aid thereby permitting a greater degree of instructor-student interaction in the learning center. The system prescribes learning activities and controls evaluation procedures while automatically recording information to be processed and presented to the instructor. The instructor uses that processed information to update instructional materials and form the basis for better professional interaction with individual students. (See Appendix B)

Activity #3.

Develop the computer program logic needed to handle the instructional information identified in activity 2.

Using the information determined in activity #1 and the processes identified in activity #2, a computer system consisting of three main files and two groups of programs was planned. The three files included an individual student file, a module file containing information and learning activities for each module and a testing file containing the test items for all modules. (See Appendix C for Module & Student File Layouts) One group of programs which students would need to interact

with the system were outlined and another set of programs which instructors could use to retrieve reports and update the system were identified.

The computer programs necessary to provide adequate learner interaction with the system were identified by constructing a schema depicting the learner, system files and the types of input-output previously discussed. A flow chart of student activities was constructed to provide a sequence which was then used to explicitly define and interrelate each of the computer programs. (See Appendix D for Learner Interaction & Flow of Student Activities)

In the flow of student activities the student first plans his program of study by selecting those modules he plans to study and identifies each module with the date he plans to start that module.

The student then completes a learning styles questionnaire and takes a pre-test, the results of which are entered into the system via an optical reader. The learning styles information is used later to prescribe appropriate learning activities and the pre-test can be used in one of two ways.

The flow chart in Appendix D shows the pre-test used as a pre-entry instrument. In this mode the student demonstrates various entry skills before he is given a learning prescription and is permitted to enter a learning module. The other way in which the pre-test can be used is in testing out of modules. If the pre-test is equivalent to the module post-

tests, then the pre-test information may be used to determine if students can bypass modules.

After students have taken the pre-test and learning styles questionnaire they will enter their name and program of study into the system via teletype or CRT in the learning center. After a program of study (list of modules with starting dates) is entered by a student, that student may approach the system via terminals in the learning center at any time to do one of the following:

a) Change his program of study.

b) Print out his current program.

c) Print out a summary of progress and his current status.

d) Request a learning activities prescription.

e) Request a test on his current module to be taken on-line on a CRT.

(See Appendix D for a List of Computer Programs for Student Use)

The computer programs necessary for instructors to interact with the system were identified by constructing a schema depicting the instructor, system files and the types of input-output previously discussed. (See Appendix E for Instructor Interaction)

Computer programs which instructors needed formed two groups, those necessary to update information in the system and those used to output reports necessary for efficient management of the learning center. After

students were enrolled and had entered their programs of study, instructors could approach the system via terminals at any time to do one or more of the following:

a) update modules and learning activities in the module file.

b) update test items in the test file.

c) print out the following reports:

1. Expected Module Entry.
2. Current Module Use.
3. Progress List for all students
4. List of students enrolled.
5. List and summary of modules available.

(See Appendix E for List of Computer Programs for Instructor Use)

Activity #4.

Write a computer program to simulate the information handling and processing required by the instructional information system.

The computer programs identified in activity #3 were written in the BASIC-PLUS programming language to be executed on the PDP-11 time-sharing computer system at UW-Stout. (See Appendix F for Computer Program Listings)

Two programs, TESTER and TESTUP, comprising the evaluation part of

the system were not written. The decision to continue without those programs considered the fact that an off-line computer generated testing system was already in use at UW-Stout. Therefore, the writing of those programs could be done quickly at a later time. Also, the Center for Vocational, Technical and Adult Education was working with Fred Timm in developing a random test generation program for the Communications Skills courses at FVTI.

Activity #5.

Pilot test the computer program at UW-Stout.

As each computer program was written, it was debugged by executing the program with explicit input data which would produce predictable output. Also, when two or more computer programs comprising a sub-system were completed, they were executed with similar input data. The final system (excluding the evaluation component) was tested with the same input data with the resulting output being compared with the predicted output.

Activity #6.

Write and/or select alternative modes of instruction for a specific unit and place these in the instructional information system.

This activity was performed in cooperation with the concurrent

Physics Project in which modules with alternative modes of instruction were being written for a basic physics course. A 5 semester credit basic physics course was divided into 14 modules and each module was outlined according to a specific format. Such things as number, name, prerequisites, alternative learning activities, etc. were stated for each module in such a way as to be easily entered into the computer system. (See Appendix G for Module Format)

Two module entry requirements were considered important for this particular application. These requirements included a list of prerequisite modules for each module and a list of prerequisite entry skills for each module. Most of the modules had other modules as prerequisites, however a few modules had no prerequisites modules thereby providing several places (areas of study) where students could enter. The prerequisite skills became the pre-test items which were to be administered at the beginning of the course. (See Appendix H for Available Modules for Physics 221 and Prerequisite Skills for Physics Courses)

After all modules for the course were identified according to the module format, a set of explicit behavioral objectives were written for each module. (See Appnedix I for Module #125 Objectives) A general list of possible learning activities were selected for each objective. (See Appendix I for Module #125 Activities)

The process of prescribing only those activities which were most

closely matched to the student's learning styles required that each activity be associated with a set of styles. For this particular application two style continua (symbolic-concrete and unstructured-structured) were selected and each activity was assigned a two element array which placed that activity on the two continua. (See Appendix J for Use of Learning Styles to Prescribe Learning Activities)

The last step in preparing the system for operation involved entering the module information. Computer program 'MODADD' was used to enter the basic information about each module as listed in Appendix G. Then 'MODSUM' was used to enter the activities for module #125 as listed in Appendix I.

Activity #7.

Test the feasibility of the alternative modes of instruction as managed by the instructional information system. These tests will be conducted at Fox Valley Technical Institute by means of a portable remote-entry data terminal. This terminal will be placed on line with the PDP 11/40 system based at UW-Stout. Students and teachers will be able to utilize this system and will be requested to evaluate it in terms of its functionality and effectiveness in processing the data they need. A

preliminary cost/benefit analysis will be conducted on the instructional information system.

Since the remote-entry data terminal was not available and FVTI's time-sharing system was not operational the feasibility test was not done at Fox Valley Technical Institute. However a test involving selected faculty and students at UW-Stout was conducted. A one page sample 'Information to Students' sheet was attached to the list of available modules and distributed to several faculty members and students so they could plan a program of study and enter that program into the system. (See Appendix K for Information to Students and a sample of the terminal interaction printout of a student entering and listing his program of study.)

After the students' programs of study were entered they were asked to run the computer program NXTMOD which would provide a Learning Activities Prescripton for their first module. However, since only the activities for module #125 were available in the system, only those students who were eligible for that module received a Learning Activities Prescription. (See Appendix L for samples of Learning Activities Prescription)

The computer programs producing the following reports to faculty were also run to complete the system test.

a) Expected Module Entry

b) Progress Report

c) Current Module Activity

d) Module Summary

(See Appendix M for samples of those reports)

In April and May, 1974 the researcher made two presentations to FVTI staff on the model, the system and the types of reports provided for teachers and students. No additional information needs were defined during these meetings.

During Professional Growth Week-II held at UW-Stout during the week of June 4 - 8, 1974, the researcher demonstrated the system and discussed applications with the vocational teachers in attendance.

IV. ANALYSIS

Most of the information determined to be necessary to individualize instruction based on learning styles was used in the model. The student's initial program of study was used to provide reports on expected module use, and all faculty members who tested the system agreed that those reports would be useful in managing instruction in a learning center environment. The learning styles information was used directly to match activities styles to student's learning styles. Actual accumulated pre-test and post-test information was not available for testing because the evaluation component of the system was not completed. However, dummy data was used for this accumulated information thereby permitting a more complete test of the system.

The particular application to which the model was tested used the pre-test component for determining entry requirements. To insure that students entering a particular module possessed those skills needed to perform the learning activities, a pre-test of those skills was given before starting a series of modules. That pre-test information was then entered into each student's file and the system controlled module entry based on the results of the pre-test.

With minor changes in some of the computer programs, the pre-test information could be used to bypass modules instead of permitting entry to those modules. This mode of operation would require that the pre-test test the objectives of each module the student was planning to study.

The key component of the learning styles based system is the output of learning prescriptions in which the activities for each objective are listed in sequence of decreasing compatability with the student's learning styles. Although the application in which the system was tested required that all activities be presented to all students, it is feasible to list only the first few activities for each objective, thereby prescribing only those activities which best match the styles of the learner.

Appendix L shows learning prescriptions for two students entering the same module. For the two style continua used in the test one student placed average on the symbolic-concrete continuum and toward the unstructured end of the other continuum. That student was given a supple-

mental reading as his best activity for objective #1. The other student placed toward the symbolic end of one continuum and toward the structured end of the other continuum. That student was given a taped mini-lecture as his best activity for objective #1. If the supplemental reading is more unstructured and the taped mini-lecture is more structured in nature one would expect those activities to be assigned to the respective students.

A critical phase in the prescriptive process concerns the procedure by which each activity was placed on the two style continua. For this test each activity was analyzed by the investigator and assigned a position on the style continua. Although analysis from several experienced teachers would be more valid, other methods utilizing feedback within the system should be considered.

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APPENDIX A

INFORMATION NECESSARY TO INDIVIDUALIZE
INSTRUCTION BASED ON LEARNING STYLES

Information Associated With Each Student

1. Initial program, history of program changes and current status.
   a) List of modules in program.
   b) Planned dates of entry and exit from each module.
   c) Noted changes in program.
   d) Current status or amount of program completed.
2. Learning styles and accumulated styles information.
   a) Information from learning styles questionnaire.
   b) Accumulated data on styles actually used.
3. Accumulated module entry skills.
   a) List of basic or unique skills demonstrated before entry to each module.
4. Accumulated test results on current module.
   a) List of all items and responses that have appeared on tests on the current module.
   b) Information necessary for constructing subsequent tests.

Information Associated With Each Module

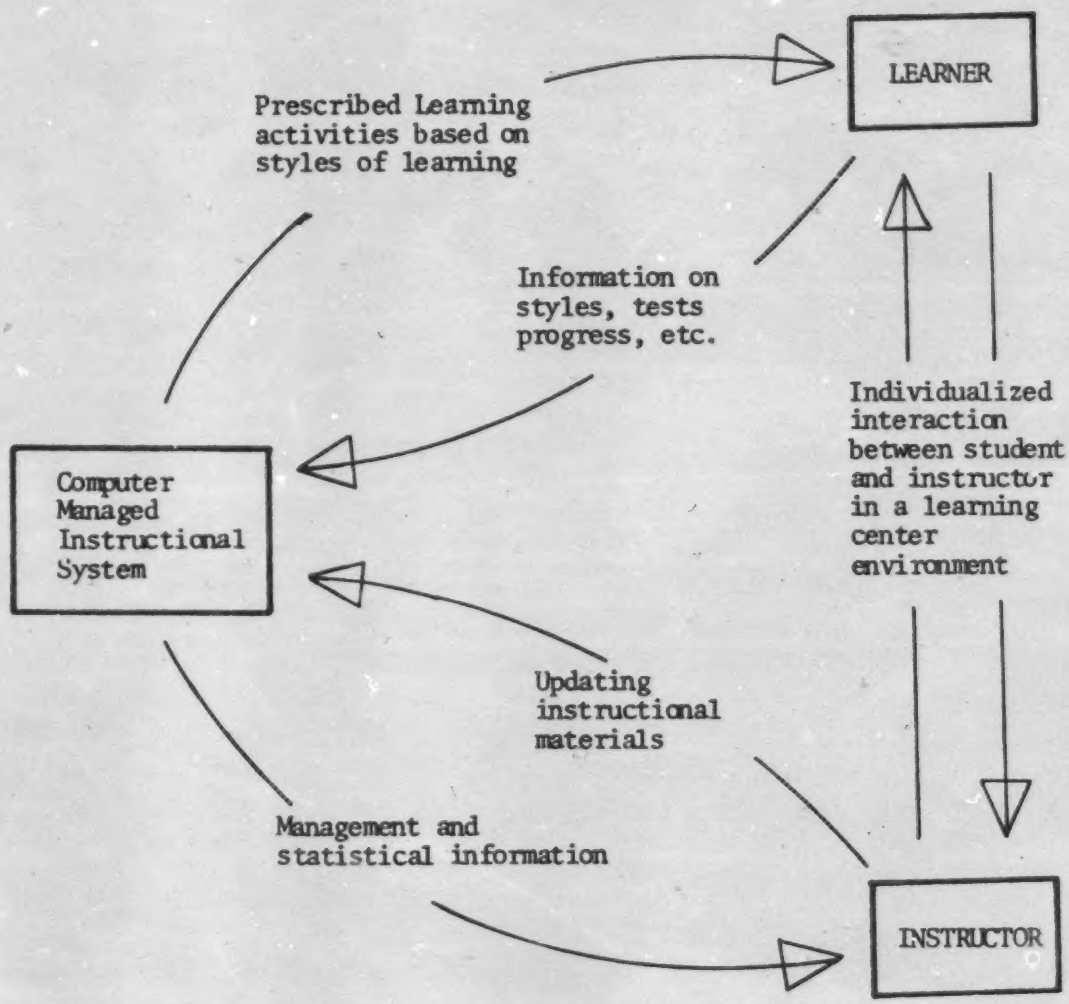
1. Entry skills and prerequisites.
   a) List of prerequisite modules.

b) List of basic or unique skills used in the module and needed by students before entry to that module.

2. Objectives with available learning experiences.
   a) List of behavioral objectives.
   b) List of various activities associated with and/or keyed to the objectives.
   c) Information or algorithm relating the measured learning styles to the various learning activities.
3. Pool or test items.
   a) Several items for each objective.
4. Accumulated information on tests.
   a) Usage, difficulty and correlation of items and groups of items associated with objectives.
5. Accumulated information on use of learning activities.

APPENDIX B

LEARNER-INSTRUCTOR-SYSTEM INTERACTION


LEARNER
Prescribed Learning activities based on styles of learning
Information on styles, tests progress, etc.
Individualized interaction between student and instructor in a learning center environment
Computer Managed Instructional System
Updating instructional materials
Management and statistical information
INSTRUCTOR

APPENDIX C

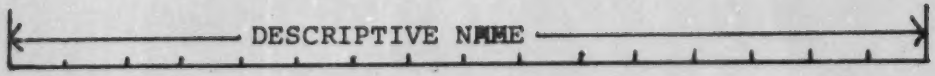
Module & Student File Layouts

File Name: MODULE

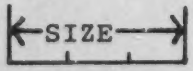
M%(M)

M1$(n)=8

M$(n)=32



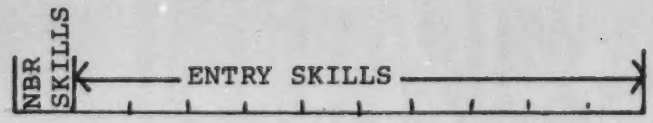
C2(M)



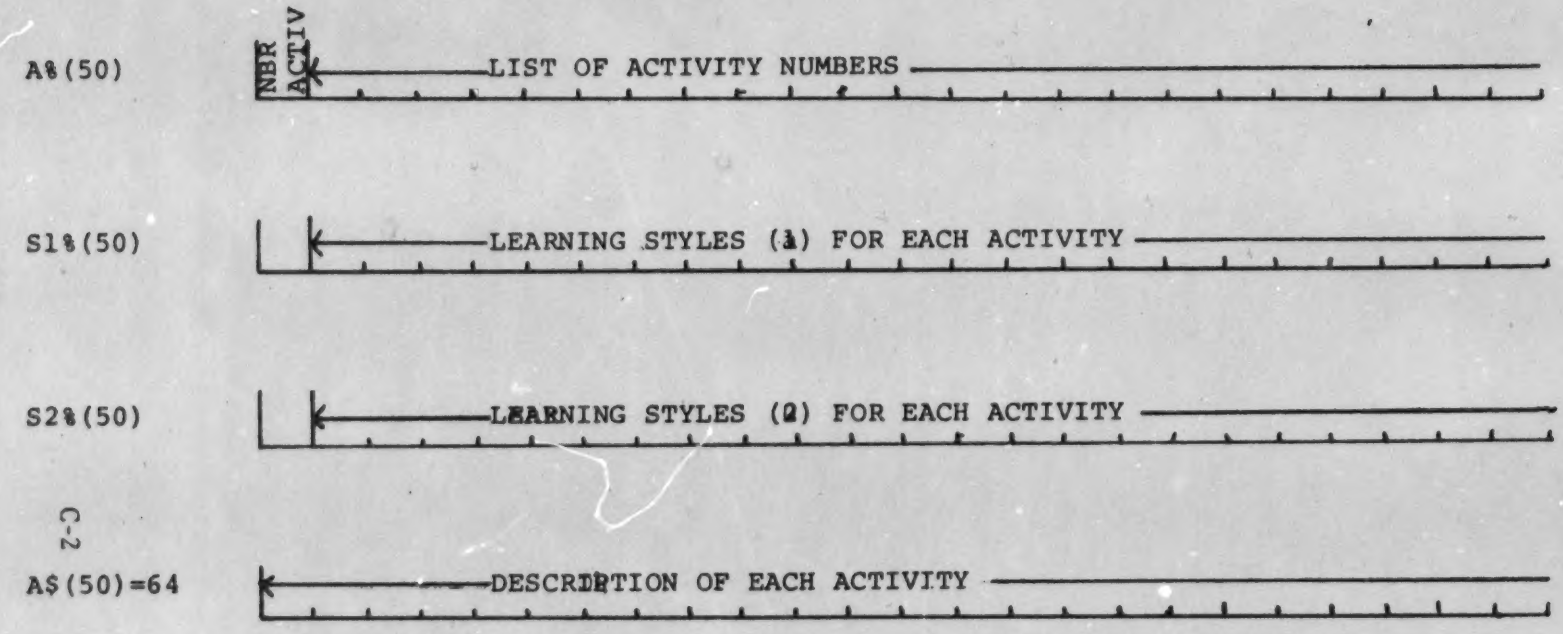
D3%(M,1)

R%(M,3)

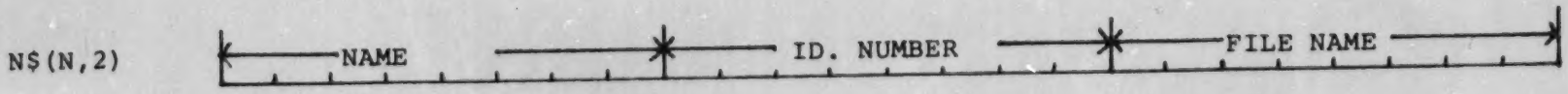
K%(M,10)



File Name: MOD999



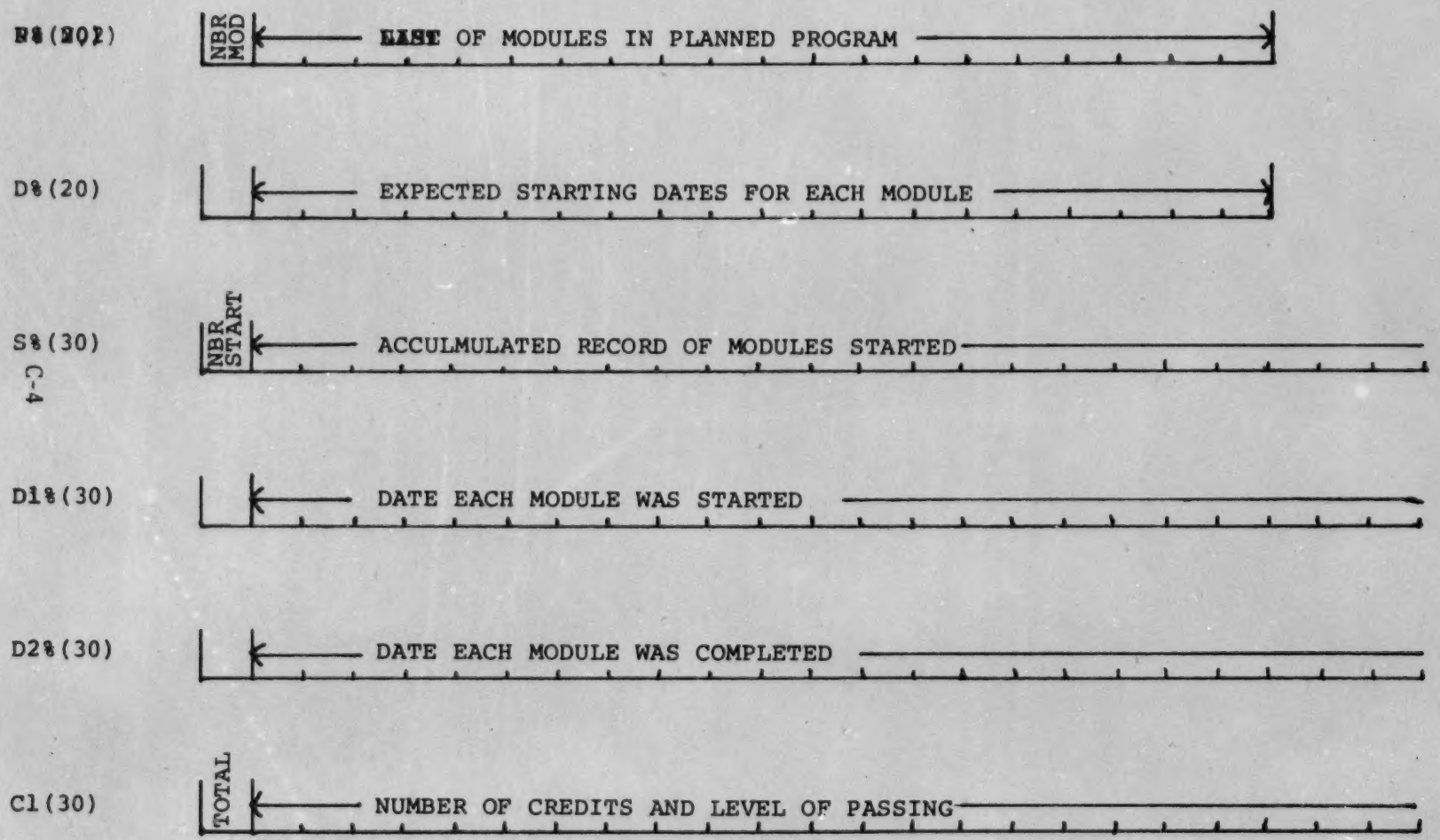
File Name: STUDNT

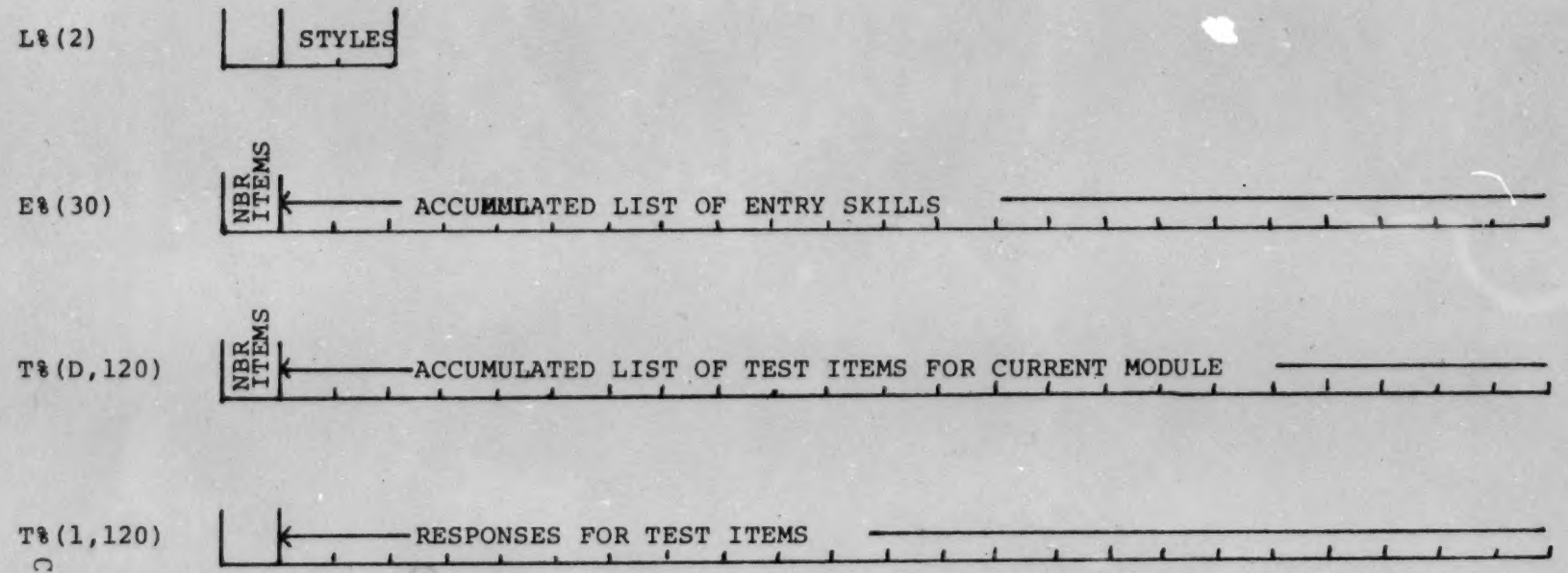


9999 DIM #N, N$(400,2)

SIZE = 38 blocks for 400 students

File Name: NAME99





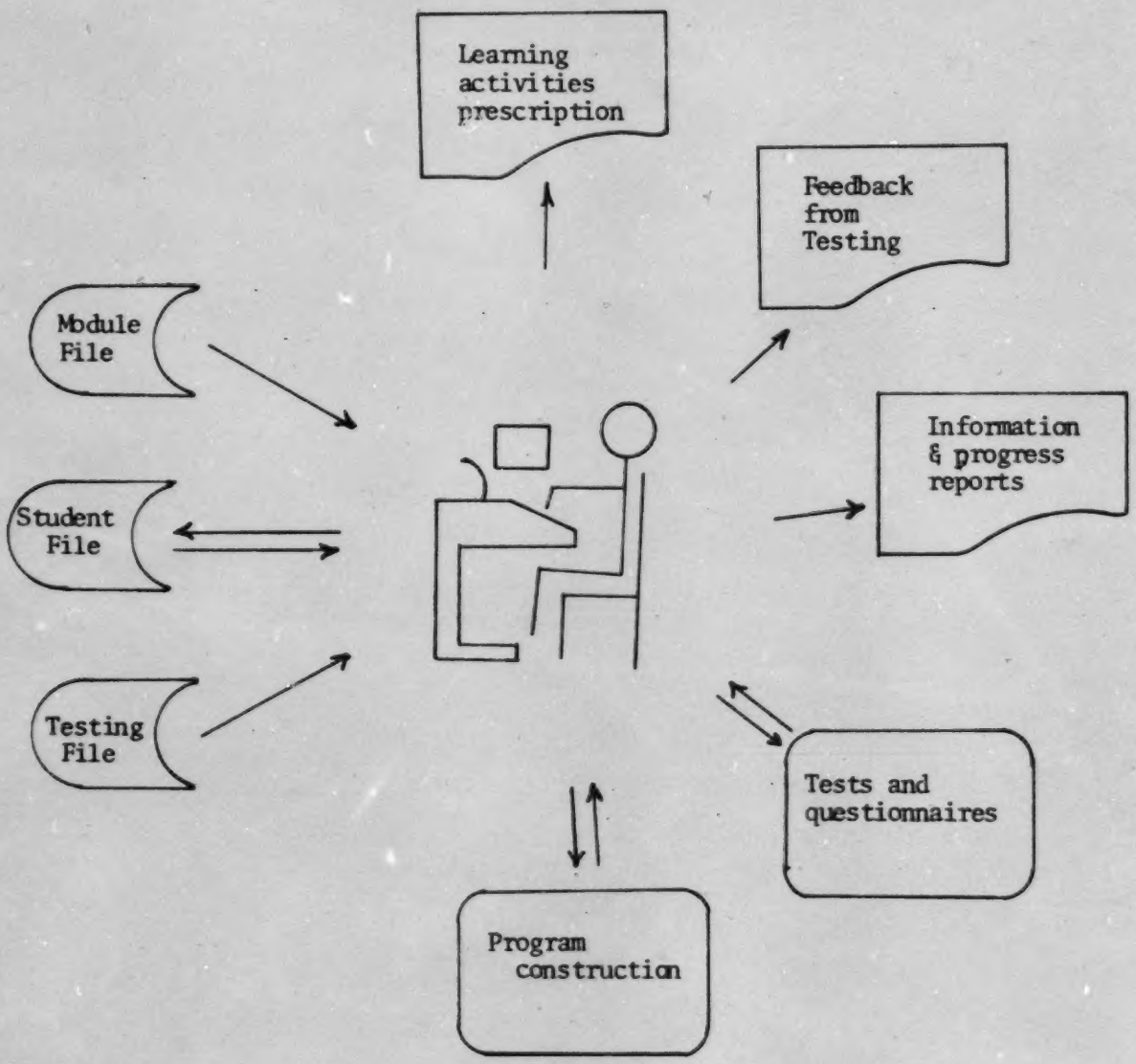
C-5

9999 DIM #N, P%(20), D%(20), S%(30), D1%(30), D2%(30), C1(30), L%(2), E%(30), T%(1,120)

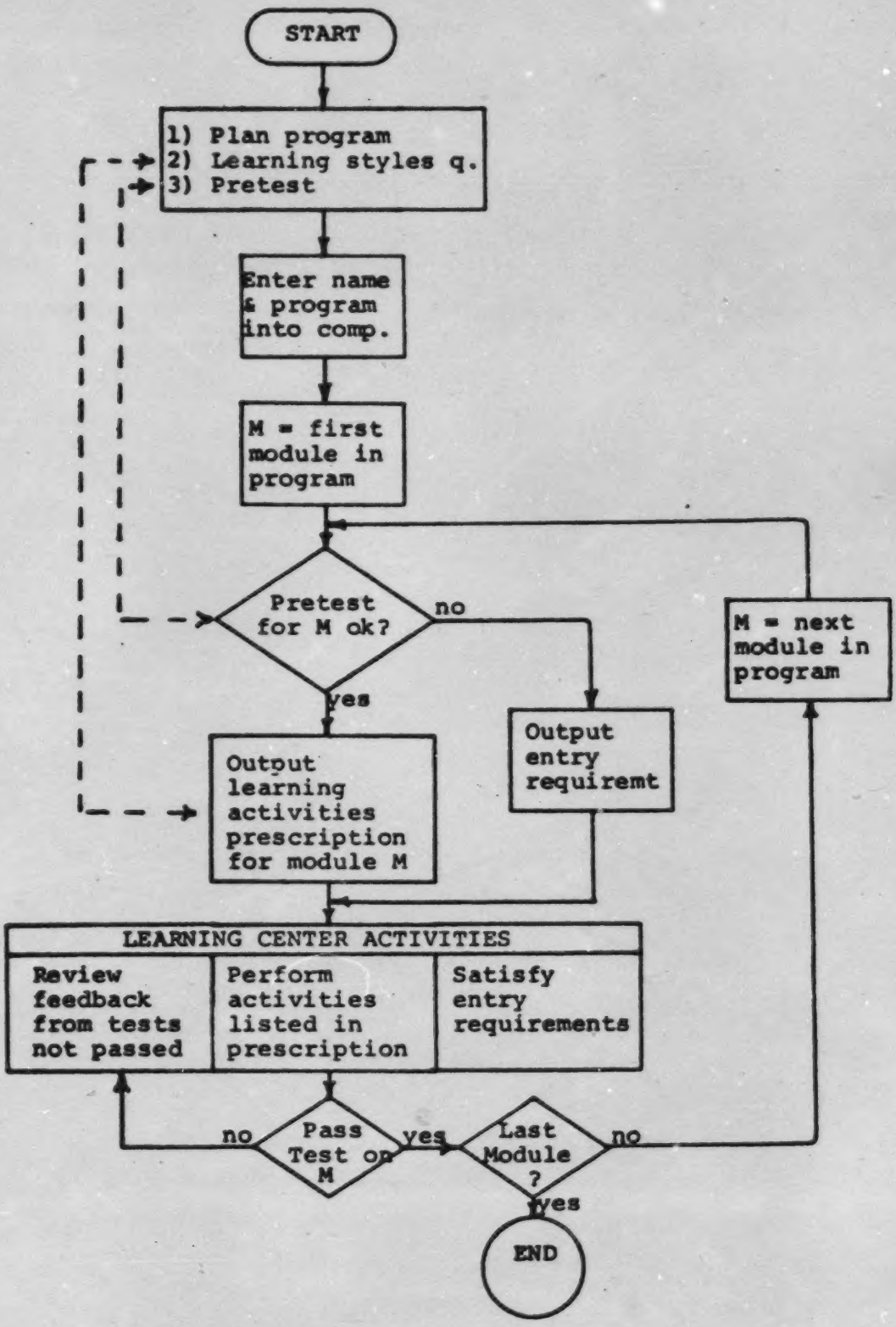
SIZE = 2 blocks/student

APPENDIX D

LEARNER INTERACTION



FLOW OF STUDENT ACTIVITIES



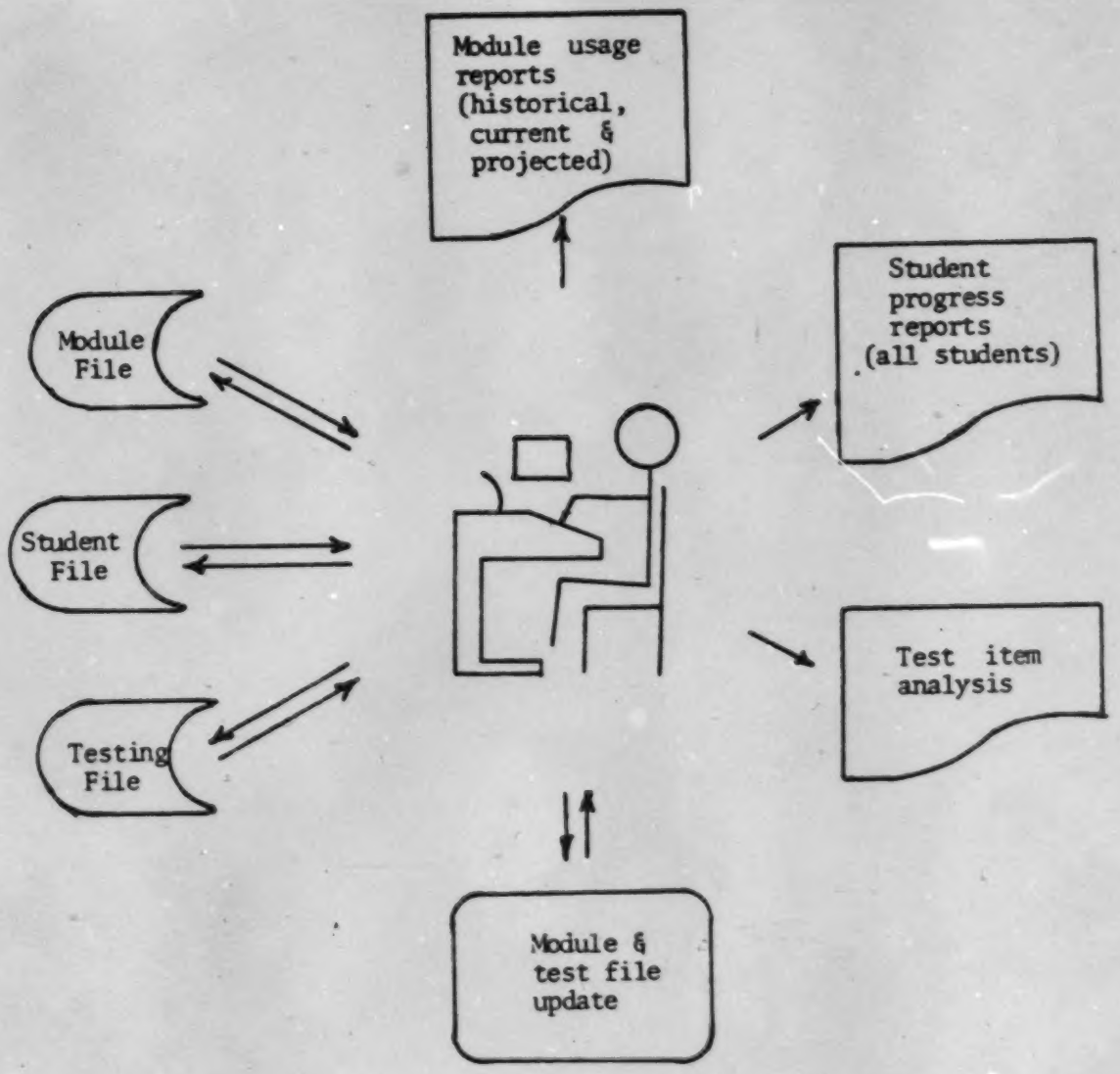
D-1

LIST OF COMPUTER PROGRAMS FOR STUDENT USE

Program Name	Program Function
MAINST - - -	main student program used to identify a student with his file and chain to the program he selects. After that program has been executed the system will chain back to this program and wait for another user.
ENROLL - - -	enter a new name in the student file in alphabetical order and initialize an individual file for that name.
PROGRM - - -	enter or change a program of study for a student. This program will be used by students to enter their planned program of study into their file and update any changes in that program.
PGMLST - - -	list the program of study for a particular student. This program provides a list of planned modules and expected starting dates in a students program of study.
STATUS - - -	print out a summary of the history and current status of a student. This program lists all of the modules a student has completed with dates of completion and the level of achievement for each module. The report includes the status of the student on his current module.
NXTMOD - - -	print out the learning prescription for the next module of a students program. This program will use the learning styles information from the questionnaire to select those learning activities which most closely match the students style of learning.
TESTER - - -	provides a mastery test on the current module. This program will present the student with a test on a CRT. As the student responds to the items, they are graded and the results are stored in his file. The program will either record if the student passes the module or provide feedback about which objectives require additional study.

APPENDIX E

INSTRUCTOR INTERACTION



LIST OF COMPUTER PROGRAMS FOR INSTRUCTOR USE

Program Name	Program Function
DROPER	delete a student from the system.
EXPUSE	print out the expected module entry report.
MODADD	enter a new module in the module file or delete an old module.
MODSUM	print out a module summary showing the basic features of all modules.
MODUPD	add, delete or update activities for an existing module.
MODUSE	print out the current module use report.
NAMLST	print out list of students enrolled.
PRGRES	print out the progress list report which shows the current standing of all students.
SKILLS	add, delete or update entry skills.
TESTUP	add, delete or update test items in the test file.

APPENDIX F

Computer Program Listings

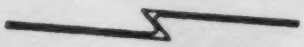
```
MAINST  01:02 PM        18-JUN-74
1000 ØN ERRØR GØ TØ 6000
1010 PRINT: PRINT: PRINT
1085 PRINT"1-ENRØLL, 2-PRØGRM, 3-PGMLST, 4-STATUS, 5-NXTMØD, 6-TESTER"
1500 PRINT: PRINT: INPUT N9%
1510 IF N9%>1 THEN 1520
1515 PRINT "WAIT": CHAIN "ENRØLL"
1520 C8=0
1540 INPUT "NAME PLEASE"; N1$
1560 L=LEN(N1$)
1570 ØPEN "STUDNT" FØR INPUT AS FILE 1, MØDE 1
1580 DIM #1, N$(400,2)
1590 N=VAL(N$(0,0))
1600 FØR J=1 TØ N
1610 IF LEFT(N1$,L)=LEFT(N$(J,0),L) THEN 1710
1620 NEXT J
1630 PRINT "SØRRY - BUT I CAN'T FIND YØUR NAME ØN THE CLASS LIST."
1640 PRINT "PLEASE USE THE SAME NAME UNDER WHICH YØU ENRØLLED"
1650 PRINT "ØR TRY ENTERING YØUR LAST NAME ØNLY."
1660 C8=C8+1
1670 CLØSE 1
1680 IF C8<3 THEN 1540
1690 PRINT "SEE AN INSTRUCTØR FØR A PØSSIBLE ERRØR."
1700 GØ TØ 9990
1710 IF LEFT(N1$,L)<>LEFT(N$(J+1,0),L) THEN 1780
1730 PRINT "THE NAME YØU ENTERED IS EQUAL TØ BØTH ØF THE FØLLØWING."
1740 PRINT N$(J,0): PRINT N$(J+1,0): PRINT "TRY AGAIN"
1760 CLØSE 1
1770 GØ TØ 1540
1780 N1$=N$(J,0): N2$=N$(J,1): N3$=N$(J,2)
1790 CLØSE 1
1800 PRINT "CØNFIRM "; N1$; " "; N2$
1810 INPUT "TYPE Y ØR N"; N9$
1820 IF N9$<>"Y" THEN 9990
1830 ØPEN "TMP" AS FILE 9
1840 PRINT #9, N1$; ","; N3$
1850 CLØSE 9
1860 PRINT "WAIT"
1870 ØN N9% GØ TØ 3100, 3200, 3300, 3400, 3500, 3600
3100 CHAIN "ENRØLL"
3200 CHAIN "PRØGRM"
3300 CHAIN "PGMLST"
3400 CHAIN "STATUS"
3500 CHAIN "NXTMØD"
3600 CHAIN "TESTER"
6000 IF ERR<> 19 THEN ØN ERRØR GØ TØ 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
9990 CHAIN "MAINST"
9999 END

READY
```

```
ENRØLL  01:09 PM         18-JUN-74
1000 ØN ERRØR GØ TØ 6000
1020 PRINT "PLEASE TYPE YØUR LAST NAME FIRST"
1030 INPUT "THEN SPACE AND FIRST NAME"; N1$
1040 PRINT "CØNFIRM "; N1$: INPUT "TYPE Y ØR N"; N9$
1050 IF N9$<>"Y" THEN 1020
1060 INPUT "PLEASE TYPE YØUR ID-NUMBER"; N2$
1070 PRINT "CØNFIRM "; N2$: INPUT "TYPE Y ØR N"; N9$
1080 IF N9$<>"Y" THEN 1060
1090 ØPEN "STUDNT" FØR INPUT AS FILE 1, MØDE 1
1100 DIM #1, N$(400,2)
1110 N=VAL(N$(0,0))
1120 FØR J=1 TØ N
1130 IF N1$<N$(J,0) THEN 1200
1140 IF N1$>N$(J,0) THEN 1180
1150 PRINT "YØUR NAME ALREADY EXISTS IN THE FILE"
1160 PRINT "PLEASE CØNTACT AN INSTRUCTØR BEFØRE ENRØLLING."
1170 CLØSE 1: GØ TØ 9990
1180 NEXT J
1190 J1=N+1: GØ TØ 1225
1200 FØR J1=N TØ J STEP -1
1210 FØR K=0 TØ 2: N$(J1+1,K)=N$(J1,K): NEXT K
1220 NEXT J1
1225 J9=0
1230 J9=J9+1
1235 N3$=LEFT(N1$,4)+NUM$(J9)
1240 FØR K=1 TØ N
1250 IF N3$=N$(K,2) THEN 1230
1260 NEXT K
1270 N$(J1,0)=N1$: N$(J1,1)=N2$: N$(J1,2)=N3$: N$(0,0)=NUM$(N+1)
1280 CLØSE 1
1290 ØPEN N3$ AS FILE 2, CLUSTERSIZE 2
1300 DIM #2, P%(20), D%(20), S%(30), D1%(30), D2%(30), C1(30),
          L%( 2), E%(30), T%(1,120)
1310 P%(0)=0: S%(0)=0: C1(0)=0: E%(0)=0
1320 T%(0,0)=0: T%(1,120)=0
1330 CLØSE 2
1340 PRINT "ENRØLLMENT ØF "; N1$; " IS CØMPLETE"
1345 PRINT "WAIT"
1350 GØ TØ 9990
6000 IF ERR<>19 THEN ØN ERRØR GØ TØ 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
9990 CHAIN "MAINST"
9999 END

READY
```

```
PRØGRM  01:20 PM        18-JUN-74
1000 ØN ERRØR GØ TØ 6000
1010 ØPEN "TMP" FØR INPUT AS FILE 9, MØDE 1
1020 INPUT #9, N1$, N3$
1030 CLØSE 9
1040 ØPEN N3$ FØR INPUT AS FILE 1, MØDE 1
1050 DIM #1, P%(20), D%(20), S%(30), D1%(30), D2%(30), C1(30),
          L%( 2), E%(30), T%(1,120)
1060 IF P%(0)=0 THEN 1200
1070 PRINT "YØUR CURRENT PRØGRAM EXISTS ØF THE FØLLØWING MØDULES:"
1080 FØR K=1 TØ P%(0): PRINT P%(K): NEXT K
1090 PRINT "DID YØU INTEND TØ CHANGE ØR LENGTHEN THAT PRØGRAM"
1100 INPUT "TYPE Y ØR N"; N9$
1110 IF N9$<>"Y" THEN 9990
1120 IF S%(0)<>0 THEN 1130
1122 PRINT "YØUR CURRENT PRØGRAM IS NØW DELETED"
1124 PRINT "START ENTERING YØUR NEW PRØGRAM"
1126 GØ TØ 1200
1130 K=S%(0)
1140 PRINT "YØUR NEW PRØGRAM MUST START AFTER MØDULE #"; S%(K)
1150 PRINT "ALL MØDULES AFTER"; S%(K); "ARE NEW DELETED."
1160 FØR L=1 TØ P%(0)
1170 IF S%(K)=P%(L) THEN 1190
1180 NEXT L: PRINT "ERRØR IN PRØGRM AT LINE 1180": GØ TØ 9990
1190 P%(0)=1: P%(1)=P%(L): D%(1)=D%(L)
1200 PRINT "ENTER MØDULE NUMBERS IN THE SEQUENCE IN WHICH YØU"
1210 PRINT "PLAN TØ CØMPLETE THEM.  ALSØ ENTER THE DATE YØU PLAN"
1220 PRINT "TØ START EACH MØDULE.  LAST MØDULE NUMBER SHØULD BE"
1225 PRINT "ZERØ TØ TERMINATE PRØGRAM ENTRY.": PRINT
1230 IF S%(0)>0 THEN C8=2 ELSE C8=1
1240 FØR K=C8 TØ 30
1250 INPUT "MØDULE #"; M1
1252 FØR K9=1 TØ P%(0)
1254 IF M1<>P%(K9) THEN 1258
1256 PRINT M1; "IS ALREADY INCLUDED": GØ TØ 1250
1258 NEXT K9
1260 IF M1=0 THEN 1640
1270 ØPEN "MØDULE" FØR INPUT AS FILE 2, MØDE 1
1280 DIM #2, M%(40), M1$(40)=8, M$(40)=32, C2(40),
          D3%(40,1), R%(40,3), K%(40,10)
1290 M=M%(0)
1300 FØR L=1 TØ M
1310 IF M%(L)=M1 THEN 1350
1320 NEXT L
1330 CLØSE 2
1340 PRINT "MØDULE #"; M1; "IS NØT AVAILABLE": GØ TØ 1250
1350 IF R%(L,0)=0 THEN 1510
1360 IF K>1 THEN 1410

READY
```

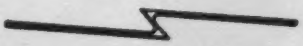
```
1370 PRINT "THAT MØDULE HAS THE FØLLØWING PREREQUISITE MØDULE(S):"
1380 FØR K1=1 TØ R%(L,0): PRINT R%(L,K1): NEXT K1
1390 CLØSE 2: PRINT "SELECT ANØTHER MØDULE ØR ENTER ZERØ."
1400 GØ TØ 1250
1410 FØR K1=1 TØ R%(L,0)
1420 FØR K2=1 TØ P%(0)
1430 IF R%(L,K1)=P%(K2) THEN 1500
1440 IF S%(0)=0 THEN 1480
1450 FØR K3=1 TØ S%(0)
1460 IF R%(L,K1)=S%(K3) THEN 1500
1470 NEXT K3
1480 NEXT K2
1490 GØ TØ 1370
1500 NEXT K1
1510 D1=D3%(L,0): D2=D3%(L,1): CLØSE 2
1515 C9=0
1520 GØSUB 7000
1530 IF X8%>=D1 AND X8%<D2 THEN 1590
1540 IF C9=0 THEN 1570
1545 X8%=D1
1550 PRINT "FIRST DATE AVAILABLE HAS BEEN ENTERED."
1560 GØ TØ 1590
1570 PRINT "STARTING DATE ØUTSIDE MØDULE AVAILABILITY - TRY AGAIN."
1580 C9=1: GØ TØ 1520
1590 IF D2-X8%>4 THEN 1620
1600 PRINT "WARNING - YØU HAVE ØNLY"; D2-X8%; "DAYS"
1610 PRINT "TØ CØMPLETE MØDULE"; M1
1620 P%(K)=M1: P%(0)=K: D%(K)=X8%
1630 NEXT K
1640 IF P%(0)=0 THEN PRINT "NØ PRØGRAM ENTERED" ELSE
     PRINT "PRØGRAM ENTRY IS CØMPLETE"
1645 PRINT "WAIT"
1650 GØ TØ 9990
6000 IF ERR<>19 THEN ØN ERRØR GØ TØ 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
7000 X1$="JANFEBMARAPRMAYJUNJULAUGSEPØCTNØVDEC"
7010 X2$="000031059090120151181212243273304334"
7020 X3$="000003650730109 5"
7030 INPUT "STARTING MØNTH-XXX"; X4$
7040 X5%=INSTR(1,X1$,LEFT(X4$,3))
7050 INPUT "DAY"; X6%
7060 X7%=VAL(MID(DATE$(0),8,2))
7070 X8%=VAL(MID(X2$,X5%,3))+VAL(MID(X3$,(X7%-73)*4-3,4))+X6%
7080 RETURN
9990 CLØSE 1: CHAIN "MAINST"
9999 END

READY
```

Program: PGMLST



CURRENT PROGRAM
XXXXXXXXXXXXXXXX
999-99-9999
99-XXX-99

NUMBER	MODULE DESCRIPTION	CREDITS	STARTING DATE
999	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	.9	99 XXX 99
999	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	.9	99 XXX 99



1. This program will list only those modules that exist in the current program. Modules completed before a program change will be included in a 'STATUS' list.

EXAMPLE:

CURRENT PROGRAM
JOHNSON BIG J
123-45-6789
17-MAR-74

NUMBER	MODULE DESCRIPTION	CREDITS	STARTING DATE
110	LINEAR MOTION AND TRAJECTORIES	.5	25 DEC 84
115	VECTORS AND FORCES	.4	15 JAN 85

```
PGMLST  01:29 PM        18-JUN-74
1000 ØN ERRØR GØ TØ 6000
1010 ØPEN "TMP" FØR INPUT AS FILE 9, MØDE 1
1020 INPUT #9, N1$, N3$
1030 CLØSE 9
1040 ØPEN N3$ FØR INPUT AS FILE 1, MØDE 1
1050 DIM #1, P%(20), D%(20), S%(30), D1%(30), D2%(30), C1(30),
          L%( 2), E%(30), T%(1,120)
1060 IF P%(0)>0 THEN 1080
1070 PRINT "NØ PRØGRAM EXIST FØR "; N1$: GØ TØ 9990
1080 PRINT: PRINT: PRINT "CURRENT PRØGRAM"
1090 PRINT N1$: PRINT DATE$(0): PRINT
1100 PRINT "NUMBER"; TAB(16); "MØDULE DESCRIPTIØN"; TAB(43);
     "SIZE     STARTING DATE": PRINT
1110 ØPEN "MØDULE" FØR INPUT AS FILE 2, MØDE 1
1120 DIM #2, M%(40), M1$(40)=8, M$(40)=32, C2(40),
          D3%(40,1), R%(40,3), K%(40,10)
1130 FØR K=1 TØ P%(0)
1140 FØR L=1 TØ M%(0)
1150 IF M%(L)=P%(K) THEN 1190
1160 NEXT L
1170 PRINT TAB(2), P%(K); "DØES NØT EXIST IN FILE"
1180 GØ TØ 1210
1190 GØSUB 7000
1200 PRINT TAB(1); P%(K); TAB(9); M$(L); TAB(45); C2(L); TAB(54);
     Y2%; MID(X1$,Z-3,3); Y1%
1210 NEXT K: PRINT: PRINT: PRINT: CLØSE 2: GØ TØ 9990
6000 IF ERR<>19 THEN ØN ERRØR GØ TØ 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
7000 X1$="JANFEBMARAPRMAYJUNJULAUGSEPØCTNØVDEC"
7010 X2$="000031059090120151181212243273304334"
7030 Y2%=D%(K): Y1%=(Y2%-1)/365+74
7040 IF Y2%<366 THEN 7060
7050 Y2%=Y2%-365: GØ TØ 7040
7060 FØR Z=1 TØ 39 STEP 3
7070 IF Y2%<=VAL(MID(X2$,Z,3)) THEN 7090
7080 NEXT Z
7090 Y2%=Y2%-VAL(MID(X2$,Z-3,3))
8000 RETURN
9990 CLØSE 1: CHAIN "MAINST"
9999 END

READY
```

```
STATUS  01:32 PM         18-JUN-74
1000 ØN ERRØR GØ TØ 6000
1010 ØPEN "TMP" FØR INPUT AS FILE 9, MØDE 1
1020 INPUT #9, N1$, N3$
1030 CLØSE 9
1040 ØPEN N3$ FØR INPUT AS FILE 1, MØDE 1
1050 DIM #1, P%(20), D%(20), S%(30), D1%(30), D2%(30), C1(30),
          L%( 2), E%(30), T%(1,120)
1060 PRINT: PRINT: PRINT
1070 PRINT "STATUS ØF "; N1$; TAB(34); DATE$(0): PRINT
1080 IF S%(0)>0 THEN 1100
1090 PRINT "HAS NØT YET STARTED A MØDULE": GØ TØ 9990
1100 PRINT "MØDULE    STARTED   FINISHED  LEVEL  SIZE": PRINT
1110 FØR K=1 TØ S%(0)
1120 X8%=D1%(K)
1130 GØSUB 7000
1140 Z1=Y2%: Z2$=MID(X1$,Z-3,3): Z3=Y1%
1150 IF D2%(K)>0 THEN 1180
1160 PRINT TAB(1); S%(K); TAB(8); Z1; Z2$; Z3
1170 GØ TØ 1230
1180 X8%=D2%(K)
1190 GØSUB 7000
1200 Z4=Y2%: Z5$=MID(X1$,Z-3,3): Z6=Y1%
1210 Z7%=INT(C1(K))
1215 Z8=INT((C1(K)-Z7%)*10+.5)/10
1220 PRINT TAB(1); S%(K); TAB(8); Z1; Z2$; Z3; TAB(19);
     Z4; Z5$; Z6; TAB(31); Z7%; TAB(38); Z8
1230 NEXT K: PRINT: PRINT: PRINT: GØ TØ 9990
6000 IF ERR<>19 THEN ØN ERRØR GØ TØ 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
7000 X1$="JANFEBMARAPRMAYJUNJULAUGSEPØCTNØVDEC"
7010 X2$="000031059090120151181212243273304334"
7030 Y2%=X8%: Y1%=(Y2%-1)/365+74
7040 IF Y2%<366 THEN 7060
7050 Y2%=Y2%-365: GØ TØ 7040
7060 FØR Z=1 TØ 39 STEP 3
7070 IF Y2%<=VAL(MID(X2$,Z,3)) THEN 7090
7080 NEXT Z
7090 Y2%=Y2%-VAL(MID(X2$,Z-3,3))
8000 RETURN
9990 CLØSE 1: CHAIN "MAINST"
9999 END

READY
```

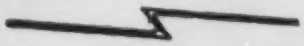
```
NXTMØD  01:42 PM        18-JUN-74
1000 ØN ERRØR GØ TØ 6000
1010 ØPEN "TMP" FØR INPUT AS FILE 9, MØDE 1
1020 INPUT #9, N1$, N3$
1030 CLØSE 9
1040 ØPEN N3$ FØR INPUT AS FILE 1, MØDE 1
1050 DIM #1, P%(20), D%(20), S%(30), D1%(30), D2%(30), C1(30),
          L%( 2), E%(30), T%(1,120)
1060 C7=P%(0): C8=S%(0)
1070 IF C7>0 THEN 1100
1080 PRINT "SØRRY - NØ PRØGRAM EXISTS FØR "; N1$
1090 GØ TØ 9990
1100 IF C8<>0 THEN 1120
1110 K=0: GØ TØ 1210
1120 IF D2%(C8)=0 THEN 1230
1130 IF P%(C7)<>S%(C8) THEN 1170
1140 PRINT "SØRRY - YØUR PRØGRAM IS CØMPLETED. YØU MUST"
1150 PRINT "ENTER A PRØGRAM ADDITIØN BEFØRE CØNTINUING."
1160 GØ TØ 9990
1170 FØR K=1 TØ C7
1180 IF P%(K)=S%(C8) THEN 1210
1190 NEXT K
1200 PRINT "ERRØR IN ENTRY AT 1200": GØ TØ 9990
1210 W=0: C8=C8+1: S%(0)=C8
1220 S%(C8)=P%(K+1): D2%(C8)=0: GØ TØ 1235
1230 W=1
1235 M=S%(C8)
1240 GØSUB 5000
1250 GØSUB 7000
1260 IF X8%<=M7% THEN 1278
1270 PRINT "MØDULE #"; M4%; "IS NØ LØNGER AVAILABLE": GØ TØ 9990
1274 IF W=1 THEN 1280
1278 D1%(C8)=X8%: C1(C8)=M9
1280 C9=0
1285 DIM S1(10)
1290 IF M8%(0)=0 THEN 1350
1300 FØR K1=1 TØ M8%(0)
1310 FØR K2=1 TØ E%(0)
1320 IF M8%(K1)=E%(K2) THEN 1340
1330 NEXT K2: C9=C9+1: S1(C9)=M8%(K1)
1340 NEXT K1
1350 IF C9=0 THEN 8000
1360 PRINT: PRINT: PRINT
1370 PRINT "PRETEST ITEMS FØR"
1380 PRINT "MØDULE #"; M4%; M6$: PRINT

READY
```

```
PSCPTN  11:04 AM          14-AUG-74
1000 ON ERROR GO TO 6000
1010 OPEN "TMP" FOR INPUT AS FILE 9, MODE 1
1020 INPUT #9, N$, S1, S2, M%, MI$, M$
1030 CLOSE 9
1040 OPEN MI$ FOR INPUT AS FILE 2, MODE 1
1050 DIM #2,  A%(50), S1%(50), S2%(50),  A$(50)=64
1060 DIM     A8%(50), S8%(50), S9%(50), A8$(50)=64
1065 DIM      X(50)
1070 N=A%(0)
1080 FOR J=1 TO N
1090 A8%(J)= A%(J)
1100 S8%(J)=S1%(J)
1110 S9%(J)=S2%(J)
1120 A8$(J)= A$(J)
1130 NEXT J
1140 CLOSE 2
1150 FOR J=1 TO N
1160 X(J)=S1*S8%(J)+S2*S9%(J)
1165 D=SQR((S1*S1+S8%(J)^2)*(S2*S2+S9%(J)^2))
1167 IF D=0 THEN D=1000
1170 X(J)=X(J)/D
1180 NEXT J
1190 PRINT: PRINT: PRINT
1200 PRINT "LEARNING ACTIVITIES PRESCRIPTION FOR:  "; N$
1205 PRINT S1;S2
1210 PRINT "MODULE #"; M%; M$; "        "; DATE$(0): PRINT
1215 PRINT "OBJ            ", "ACTIVITY"
1220 K=1: J=1
1230 IF INT(A8%(K+1)/10)<>A8%(K)/10 THEN 1300
1240 K=K+1
1250 GO TO 1230
1300 IF J=K THEN 1400
1310 FOR L1=J TO K-1
1320 FOR L2=L1+1 TO K
1330 IF X(L2)<X(L1) THEN 1370
1340 A8%( 0)=A8%(L2): A8$( 0)=A8$(L2): X( 0)=X(L2)
1350 A8%(L2)=A8%(L1): A8$(L2)=A8$(L1): X(L2)=X(L1)
1360 A8%(L1)=A8%( 0): A8$(L1)=A8$( 0): X(L1)=X( 0)
1370 NEXT L2
1380 NEXT L1
1400 PRINT INT(A8%(J)/10)
1410 FOR L=J TO K
1420 PRINT "   "; A8%(L)-10*INT(A8%(L)/10); A8$(L);
1430 NEXT L
1440 IF K>=N THEN 9990
1450 K=K+1: J=K: GO TO 1230
6000 IF ERR<>19 THEN ON ERROR GO TO 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
9990 PRINT: PRINT: PRINT: CHAIN "MAINST"
9999 END

READY
```

```
1390 ØPEN "SKLFIL" FØR INPUT AS FILE 3, MØDE 1
1400 DIM #3, F%(30), F$(30)=64
1410 FØR K1=1 TØ C9
1420 FØR K2=1 TØ F%(0)
1430 IF S1(K1)=F%(K2) THEN 1460
1440 NEXT K2
1450 PRINT S1(K1): GØ TØ 1470
1460 PRINT S1(K1); F$(K2)
1470 NEXT K1: CLØSE 3: PRINT: PRINT: PRINT
1490 GØ TØ 9990
5000 ØPEN "MØDULE" FØR INPUT AS FILE 2, MØDE 1
5005 DIM #2, M%(40), M1$(40)=8, M$(40)=32, C2(40),
          D3%(40,1), R%(40,3), K%(40,10)
5010 DIM M8%(10)
5015 FØR J=1 TØ M%(0)
5020 IF M=M%(J) THEN 5030
5025 NEXT J: PRINT "MØD #"; M " IS MISSING": CLØSE 2: GØ TØ 9990
5030 M4%=M%(J): M5$=M1$(J): M6$=M$(J): M7%=D3%(J,1): M9=C2(J)
5035 FØR K=0 TØ 10: M8%(K)=K%(J,K): NEXT K
5040 CLØSE 2
5050 RETURN
6000 IF ERR<>19 THEN ØN ERRØR GØ TØ 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
7000 X1$="JANFEBMARAPRMAYJUNJULAUGSEPØCTNØVDEC"
7010 X2$="000031059090120151181212243273304334"
7020 X3$="0000036507301095"
7030 CHANGE MID(DATE$(0),4,3) TØ X4%
7034 X4%(2)=X4%(2)-32: X4%(3)=X4%(3)-32
7036 CHANGE X4% TØ X4$
7038 X5%=INSTR(1,X1$,X4$)
7040 X6%=VAL(MID(DATE$(0),1,2)): X7%=VAL(MID(DATE$(0),8,2))
7050 X8%=VAL(MID(X2$,X5%,3))+VAL(MID(X3$,(X7%-73)*4-3,4))+X6%
7060 RETURN
8000 ØPEN "TMP" AS FILE 8
8010 PRINT #8, N1$","L%(1)","L%(2)","M4%","M5$","M6$
8020 CLØSE 1,8
8030 PRINT "WAIT": CHAIN "PSCPTN"
9990 CLØSE 1: CHAIN "MAINST"
9999 END

READY
```

```
DRØPER  01:49 PM         18-JUN-74
1000 ØN ERRØR GØ TØ 6000
1540 INPUT "NAME TØ BE DRØPPED"; N1$
1560 L=LEN(N1$)
1570 ØPEN "STUDNT" FØR INPUT AS FILE 1, MØDE 1
1580 DIM #1, N$(400,2)
1590 N=VAL(N$(0,0))
1600 FØR J=1 TØ N
1610 IF LEFT(N1$,L)=LEFT(N$(J,0),L) THEN 1710
1620 NEXT J
1630 PRINT "CAN'T FIND NAME"
1650 GØ TØ 9990
1710 IF LEFT(N1$,L)<>LEFT(N$(J+1,0),L) THEN 1800
1730 PRINT "THE NAME YØU ENTERED IS EQUAL TØ BØTH ØF THE FØLLØWING."
1740 PRINT N$(J,0): PRINT N$(J+1,0): PRINT "TRY AGAIN"
1760 CLØSE 1
1770 GØ TØ 1540
1800 PRINT "CØNFIRM "; N$(J,0); " "; N$(J,1)
1810 INPUT "TYPE Y ØR N"; N9$
1820 IF N9$<>"Y" THEN 9990
1830 F$=N$(J,2)
1840 FØR J1=J TØ N
1850 N$(J1,0)=N$(J1+1,0)
1860 N$(J1,1)=N$(J1+1,1)
1870 N$(J1,2)=N$(J1+1,2)
1880 NEXT J1
1890 KILL F$
1895 N$(0,0)=NUM$(N-1)
1900 GØ TØ 9990
6000 IF ERR<> 19 THEN ØN ERRØR GØ TØ 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
9990 CLØSE 1
9999 END

READY
```

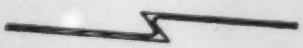
Program: EXPUSE



EXPECTED MODULE ENTRY

- BY DATE -

DATE	- - - MODULE(NBR OF STUDENTS) - - -			
99 XXX 99	999(999)	999(999)	999(999)	999(999)
99 XXX 99	999(999)	999(999)	999(999)	999(999)
99 XXX 99	999(999)	999(999)	999(999)	999(999)



1. The dates are uniformly incremented in chronological order - possibly every Monday or every Monday and Wed.

2. The Mod(nbr of students) are listed from left to right in decreasing nbr of students.

EXAMPLE:

25 JAN 74	111(52)	301(25)	118(16)	403(12)
2 FEB 74	301(70)	112(32)		
9 FEB 74	120(35)	111(14)	301(5)	

MEANS:
52 Students plan to start module 111 on or about Jan 25
25 Students plan to start module 301 on or about Jan 25
5 Students plan to start module 301 on or about Feb 9

etc.

```
EXPUSE  01:57 PM         18-JUN-74
1000 ØN ERRØR GØ TØ 6000
1010 DIM A%(20,20)
1020 MAT A%=ZER
1030 PRINT "ENTER MØNTH(XXX) AND DAY(99) YØU WANT REPØRT TØ START"
1040 INPUT X4$, X6%
1045 X9%=7
1060 X1$="JANFEBMARAPRMAYJUNJULAUGSEPØCTNØVDEC"
1070 X2$="000031059090120151181212243273304334"
1080 X5%=INSTR(1,X1$,LEFT(X4$,3))
1090 X7%=VAL(MID(DATE$(0),8,2))
1100 X8%=VAL(MID(X2$,X5%,3))+VAL(MID(X3$,(X7%-73)*4-3,4))+X6%
1120 A%(1,0)=X8%
1130 FØR J=2 TØ 20: A%(J,0)=A%(J-1,0)+X9%: NEXT J
1140 ØPEN "STUDNT" FØR INPUT AS FILE 1, MØDE 1
1150 DIM #1, N$(400,2)
1160 N=VAL(N$(0,0))
1170 FØR J=1 TØ N
1200 ØPEN N$(J,2) FØR INPUT AS FILE 2, MØDE 1
1210 DIM #2, P%(20), D%(20), S%(30), D1%(30), D2%(30), C1(30),
          L%( 2), E%(30), T%(1,120)
1220 IF P%(0)=0 THEN1370
1230 FØR K=1 TØ P%(0)
1240 IF D%(K)<A%(1,0) ØR D%(K)>=A%(20,0) THEN 1360
1250 FØR L=1 TØ 20
1260 IF D%(K)<A%(L,0) THEN 1280
1270 NEXT L: PRINT "ERRØR AT LINE 1270": GØ TØ 1360
1280 M=L-1
1290 IF M>A%(0,0) THEN A%(0,0)=M
1300 C=-1
1310 C=C+2
1320 IF C>=20 THEN 1360
1330 IF A%(M,C)=0 THEN A%(M,C)=P%(K)
1340 IF P%(K)<>A%(M,C) THEN 1310
1350 A%(M,C+1)=A%(M,C+1)+1
1360 NEXT K
1370 CLØSE 2
1380 NEXT J
1390 CLØSE 1
1400 FØR J=1 TØ A%(0,0)
1410 FØR K1=2 TØ 18 STEP 2
1420 FØR K2=K1+2 TØ 20 STEP 2
1430 IF A%(J,K2)<=A%(J,K1) THEN 1470
1440 S1=A%(J,K1)       : S2=A%(J,K1-1)
1450 A%(J,K1)=A%(J,K2): A%(J,K1-1)=A%(J,K2-1)
1460 A%(J,K2)=S1       : A%(J,K2-1)=S2
1470 NEXT K2
1480 NEXT K1
1490 NEXT J
1500 PRINT: PRINT: PRINT

READY
```

```
1510 PRINT TAB(20); "EXPECTED MØDULE ENTRY"
1520 PRINT TAB(23); "- BY DATE -": PRINT
1530 PRINT "  DATE          - - - MØDULE(NBR ØF STUDENTS) - - -"
1540 PRINT
1600 FØR J=1 TØ A%(0,0)
1610 X8%=A%(J,0)
1620 GØSUB 7000
1630 Z1=Y2%: Z2$=MID$(X1$,Z-3,3): Z3=Y1%
1640 FØR K=1 TØ 7 STEP 2
1650 IF A%(J,K)=0 THEN 1670
1660 NEXT K
1670 K=INT(K-1)/2
1680 A1$=NUM$(A%(J,1))+"("+NUM$(A%(J,2))+")"
1690 A2$=NUM$(A%(J,3))+"("+NUM$(A%(J,4))+")"
1700 A3$=NUM$(A%(J,5))+"("+NUM$(A%(J,6))+")"
1710 A4$=NUM$(A%(J,7))+"("+NUM$(A%(J,8))+")"
1720 IF K=0 THEN 1740
1730 ØN K GØ TØ 1760, 1780, 1800, 1820
1740 PRINTZ1;Z2$;Z3
1750 GØ TØ 1830
1760 PRINTZ1;Z2$;Z3;TAB(15);A1$
1770 GØ TØ 1830
1780 PRINTZ1;Z2$;Z3;TAB(15);A1$;TAB(28);A2$
1790 GØ TØ 1830
1800 PRINTZ1;Z2$;Z3;TAB(15);A1$;TAB(28);A2$;TAB(41);A3$
1810 GØ TØ 1830
1820 PRINTZ1;Z2$;Z3;TAB(15);A1$;TAB(28);A2$;TAB(41);A3$;TAB(54);A4$
1830 NEXT J
1840 GØ TØ 9999
6000 IF ERR<>19 THEN ØN ERRØR GØ TØ 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
7000 X1$="JANFEBMARAPRMAYJUNJULAUGSEPØCTNØVDEC"
7010 X2$="000031059090120151181212243273304334"
7030 Y2%=X8%: Y1%=(Y2%-1)/365+74
7040 IF Y2%<366 THEN 7060
7050 Y2%=Y2%-365: GØ TØ 7040
7060 FØR Z=1 TØ 39 STEP 3
7070 IF Y2%<=VAL(MID$(X2$,Z,3)) THEN 7090
7080 NEXT Z
7090 Y2%=Y2%-VAL(MID$(X2$,Z-3,3))
8000 RETURN
9999 END

READY
```

```
MØDADD  02:11 PM        18-JUN-74
1000 ØN ERRØR GØ TØ 6000
1010 PRINT "TØ ENTER A NEW MØDULE TYPE (NEW)"
1020 PRINT "TØ DELETE AN ØLD MØDULE TYPE (DELETE)"
1030 INPUT "ØTHERWISE (EXIT)"; R$
1040 IF R$="DELETE" THEN 1600
1050 IF R$="NEW" THEN 1070
1060 GØ TØ 9990
1070 INPUT "NEW MØDULE NUMBER ="; M1
1080 ØPEN "MØDULE" FØR INPUT AS FILE 2, MØDE 1
1090 DIM #2, M%(40), M1$(40)=8, M$(40)=32, C2(40),
          D3%(40,1), R%(40,3), K%(40,10)
1100 M=M%(0)
1110 FØR J=1 TØ M
1120 IF M1<M%(J) THEN 1200
1130 IF M1>M%(J) THEN 1170
1140 CLØSE 2
1150 PRINT "SØRRY - BUT THAT MØDULE ALREADY EXISTS."
1160 GØ TØ 9990
1170 NEXT J
1180 J1=M+1
1190 GØ TØ 1290
1200 PRINT "WAIT"
1220 FØR J1=M TØ J STEP -1
1230 FØR K=0 TØ K%(J1,0)   :  K%(J1+1,K)= K%(J1,K): NEXT K
1240 FØR K=0 TØ R%(J1,0)   :  R%(J1+1,K)= R%(J1,K): NEXT K
1250 D3%(J1+1,0)=D3%(J1,0): D3%(J1+1,1)=D3%(J1,1)
1260  C2(J1+1)  = C2(J1)   :  M$(J1+1)  = M$(J1)
1270 M1$(J1+1)  =M1$(J1)   :  M%(J1+1)  = M%(J1)
1280 NEXT J1
1290 M%(J1)=M1
1300 INPUT "MØDULE NAME IS"; M$(J1)
1310 INPUT "MØDULE SIZE IS"; C2(J1)
1320 INPUT "HØW MANY PREREQUISITE MØDULES"; C9
1330 IF C9=  0 THEN 1380
1340 IF C9<= 3 THEN 1360
1350 PRINT "LIMIT ØF THREE - TRY AGAIN": GØ TØ 1320
1360 FØR K=1 TØ C9: INPUT "PREREQ NBR IS"; R%(J1,K)
1370 NEXT K
1380 R%(J1,0)=C9
1390 INPUT "HØW MANY PRETEST ITEMS"; C9
1400 IF C9=  0 THEN 1460
1410 IF C9<=10 THEN 1430
1420 PRINT "LIMIT ØF TEN - TRY AGAIN": GØ TØ 1390
1430 FØR K=1 TØ C9
1440 INPUT "PRETEST NUMBER IS"; K%(J1,K)
1450 NEXT K

READY
```

```
1460 K%(J1,0)=C9
1470 PRINT "ENTER DATE THIS MØDULE WILL FIRST BECØME AVAILABLE."
1480 GØSUB 7000
1490 D3%(J1,0)=X8%
1500 INPUT "HØW MANY DAYS WILL THIS MØDULE BE AVAILABLE"; X8%
1510 D3%(J1,1)=D3%(J1,0)+X8%
1530 C9$="XMD"+NUM$(M1)
1540 ØPEN C9$ AS FILE 4
1550 DIM #4, A%(50), S1%(50), S2%(50), A$(50)=64
1560 A%(0)=0: A$(50)=" "
1570 CLØSE 4
1580 M1$(J1)=C9$
1585 M%(0)=M%(0)+1
1590 CLØSE 2: GØ TØ 9990
1600 INPUT "MØDULE TØ BE DELETED IS"; M1
1610 ØPEN "MØDULE" FØR INPUT AS FILE 2, MØDE 1
1615 M=M%(0)
1620 FØR J=1 TØ M
1630 IF M1=M%(J) THEN 1670
1640 NEXT J
1650 PRINT "THAT MØDULE DØES NØT EXIST"
1660 CLØSE 2: GØ TØ 9990
1670 KILL M1$(J)
1675 FØR J1=J TØ M
1680 FØR K=0 TØ K%(J1,0)  :  K%(J1,K)= K%(J1+1,K): NEXT K
1690 FØR K=0 TØ R%(J1,0)  :  R%(J1,K)= R%(J1+1,K): NEXT K
1700 D3%(J1,0)=D3%(J1+1,0): D3%(J1,1)=D3%(J1+1,1)
1710  C2(J1)  = C2(J1+1)  :  M$(J1)  = M$(J1+1)
1720 M1$(J1)  =M1$(J1+1)  :  M%(J1)  = M%(J1+1)
1730 NEXT J1
1740 M%(0)=M%(0)-1
1745 CLØSE 2
1750 PRINT "MØDULE #"; M1; "HAS BEEN DELETED": GØ TØ 9990
6000 IF ERR<>19 THEN ØN ERRØR GØ TØ 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
7000 X1$="JANFEBMARAPRMAYJUNJULAUGSEPØCTNØVDEC"
7010 X2$="000031059090120151181212243273304334"
7020 X3$="00000365073010 95"
7030 INPUT "MØNTH-XXX"; X4$:  X5%=INSTR(1,X1$,LEFT(X4$,3))
7040 INPUT "DAY";        X6%:  X7%=VAL(MID(DATE$(0),8,2))
7050 X8%=VAL(MID(X2$,X5%,3))+VAL(MID(X3$,(X7%-73)*4-3,4))+X6%
7060 RETURN
9990 END

READY
```

```
MØDSUM  02:20 PM        18-JUN-74
1000 ØN ERRØR GØ TØ 6000
1010 PRINT: PRINT: PRINT
1020 PRINT TAB(11); "MØDULE  SUMMARY  -  "; DATE$(0): PRINT
1030 PRINT "NBR"; TAB(16); "NAME"; TAB(40); "SIZE  AVAILABLE  DAYS"
1040 PRINT
1050 ØPEN "MØDULE" FØR INPUT AS FILE 2, MØDE 1
1060 DIM #2, M%(40), M1$(40)=8, M$(40)=32, C2(40),
          D3%(40,1), R%(40,3), K%(40,10)
1070 FØR J=1 TØ M%(0)
1080 D%=D3%(J,1)-D3%(J,0)
1090 X8%=D3%(J,0)
1100 GØSUB 7000
1110 Z1=Y2%: Z2$=MID(X1$,Z-3,3): Z3=Y1%
1120 PRINT M%(J); M$(J); TAB(41); C2(J); TAB(46); Z1; Z2$; Z3; TAB(58); D%
1130 IF R%(J,0)=0 THEN 1160
1140 PRINT TAB(8); "Q = ";
1150 PRINT R%(J,K); FØR K=1 TØ R%(J,0): PRINT
1160 IF K%(J,0)=0 THEN 1190
1170 PRINT TAB(8); "P = ";
1180 PRINT K%(J,K); FØR K=1 TØ K%(J,0): PRINT
1190 PRINT
1200 NEXT J
1210 GØ TØ 9990
6000 IF ERR<>19 THEN ØN ERRØR GØ TØ 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
7000 X1$="JANFEBMARAPRMAYJUNJULAUGSEPØCTNØVDEC"
7010 X2$="000031059090120151181212243273304334"
7030 Y2%=X8%: Y1%=(Y2%-1)/365+74
7040 IF Y2%<366 THEN 7060
7050 Y2%=Y2%-365: GØ TØ 7040
7060 FØR Z=1 TØ 39 STEP 3
7070 IF Y2%<=VAL(MID(X2$,Z,3)) THEN 7090
7080 NEXT Z
7090 Y2%=Y2%-VAL(MID(X2$,Z-3,3))
8000 RETURN
9990 CLØSE 2
9999 END

READY
```

```
MØDUPD  02:24 PM        18-JUN-74
1000 ØN ERRØR GØ TØ 6000
1010 INPUT "MØDULE NUMBER" M
1020 ØPEN "XMD"+NUM$(M) FØR INPUT AS FILE 2, MØDE 1
1030 DIM #2, A%(50), S1%(50), S2%(50), A$(50)=64
1040 N=A%(0)
1050 PRINT "TØ ADD ØR REPLACE AN ACTIVITY - ENTER THE ACTIVITY"
1055 PRINT "NUMBER AND FØLLØW INST FØR STYLES & DESCRIPTIØN."
1070 PRINT "NEGATIVE ACTIVITY NUMBER DELETES AN ACTIVITY."
1080 PRINT "ZERØ ACTIVITY NUMBER TERMINATES UPDATE."
1090 INPUT "NBR"; A
1100 IF A=0 THEN 1530
1110 IF A<0 THEN 1400
1130 FØR J1=1 TØ N
1140 IF A=A%(J1) THEN 1270
1150 NEXT J1
1160 FØR J=1 TØ N
1170 IF A<A%(J) THEN 1210
1180 NEXT J
1190 J1=N+1
1200 GØ TØ 1265
1210 FØR J1=N TØ J STEP -1
1220  A$(J1+1)= A$(J1):  A%(J1+1)=A%(J1)
1240 S2%(J1+1)=S2%(J1): S1%(J1+1)=S1%(J1)
1260 NEXT J1
1265 A%(0)=A%(0)+1: N=N+1
1270 A%(J1)=A
1280 INPUT "STY-1"; S1%(J1)
1290 INPUT "STY-2"; S2%(J1)
1300 PRINT "DESCRIPTIØN"
1305 INPUT LINE S$
1310 IF S$=" " THEN 1090
1320 A$(J1)=S$
1330 GØ TØ 1090
1400 A=-1*A
1410 IF N=0 THEN 1090
1420 FØR J=1 TØ N
1430 IF A=A%(J) THEN 1450
1440 NEXT J: GØ TØ 1090
1450 FØR J1=J TØ N
1460  A$(J1)= A$(J1+1):  A%(J1)=  A%(J1+1)
1470 S2%(J1)=S2%(J1+1): S1%(J1)=S1%(J1+1)
1500 NEXT J1
1510 A%(0)=A%(0)-1: N=N-1
1520 GØ TØ 1090
1530 INPUT "FØR A LIST ØF ALL ACTIVITIES TYPE Y ELSE N"; N$
1540 IF N$<>"Y" THEN 9990
1550 PRINT: PRINT: PRINT
1560 PRINT "ACTIVITIES LIST FØR MØDULE #"; M: PRINT
1570 FØR J=1 TØ N
1580 PRINT A%(J); A$(J);
1590 PRINT TAB(8); "STYLES-"; S1%(J); S2%(J)
1600 NEXT J: PRINT: PRINT: PRINT: GØ TØ 9990
9990 CLØSE 2                          F-18
9999 END

READY
```

```
MØDUSE  02:32 PM          18-JUN-74
1000 ØN ERRØR GØ TØ 6000
1010 ØPEN "STUDNT" FØR INPUT AS FILE 1, MØDE 1
1020 DIM #1, N$(400,2)
1030 N=VAL(N$(0,0))
1040 DIM N2$(400), N%(40,3)
1050 FØR J=1 TØ N: N2$(J)=N$(J,2): NEXT J
1060 CLØSE 1
1070 ØPEN "MØDULE" FØR INPUT AS FILE 3, MØDE 1
1080 DIM #3, M%(40), M1$(40)=8, M$(40)=32, C2(40),
          D3%(40,1), R%(40,3), K%(40,10)
1090 M=M%(0)
1100 FØR J=1 TØ M: N%(J,0)=M%(J): NEXT J
1110 CLØSE 3
1120 MAT N%=ZER
1130 FØR J=1 TØ N
1140 ØPEN N2$(J) FØR INPUT AS FILE 2, MØDE 1
1150 DIM #2, P%(20), D%(20), S%(30), D1%(30), D2%(30), C1(30),
          L%( 2), E%(30), T%(1,120)
1160 S=S%(0): P=P%(0)
1190 IF D2%(S)<>0 THEN 1280
1200 FØR K=1 TØ M
1210 IF S%(S)=N%(K,0) THEN N%(K,2)=N%(K,2)+1
1220 NEXT K
1230 IF S<2 THEN 1310
1235 FØR K1=1 TØ S-1
1240 FØR K=1 TØ M
1250 IF S%(K1)=N%(K,0)  THEN N%(K,1)=N%(K,1)+1
1260 NEXT K
1265 NEXT K1
1270 GØ TØ 1310
1280 FØR K=1 TØ M
1290 IF S%(S)=N%(K,0) THEN N%(K,1)=N%(K,1)+1
1300 NEXT K
1310 IF P=0 THEN 1500
1320 IF S=0 THEN 1410
1330 FØR K=1 TØ P
1340 IF S%(S)=P%(K) THEN 1360
1350 NEXT K
1360 IF K=P THEN 1500
1370 FØR L=1 TØ M
1380 IF P%(K+1)=N%(L,0) THEN N%(L,3)=N%(L,3)+1
1390 NEXT L
1400 GØ TØ 1500
1410 FØR K=1 TØ M
1420 IF P%(1)=N%(K,0) THEN N%(K,3)=N%(K,3)+1
1430 NEXT K
1500 CLØSE 2
1510 NEXT J

READY
```

```
1600 PRINT: PRINT: PRINT
1610 PRINT "CURRENT MØDULE ACTIVITY - "; DATE$(0)
1620 PRINT
1630 PRINT "MØDULE  STUDENTS  STUDENTS  STUDENTS"
1640 PRINT "NUMBER  FINISHED   ACTIVE   EXPECTED"
1650 PRINT
1660 FØR J=1 TØ M
1670 PRINT N%(J,0);TAB(11);N%(J,1);TAB(21);N%(J,2);TAB(31);N%(J,3)
1680 NEXT J
1690 GØ TØ 9999
6000 IF ERR<>19 THEN ØN ERRØR GØ TØ 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
9999 END

READY
```

```
NAMLST  02:39 PM          18-JUN-74
1000 ØN  ERRØR GØ TØ 6000
1010 ØPEN "STUDNT" FØR INPUT AS FILE 1, MØDE 1
1020 DIM #1, N$(400,2)
1030 N=VAL(N$(0,0))
1040 FØR J=1 TØ N
1050 PRINT N$(J,0); TAB(16); N$(J,2)
1060 NEXT J
1070 CLØSE  1
1080 GØ TØ 9999
6000 IF ERR<>19 THEN ØN ERRØR GØ TØ 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
9999 END

READY
```

```
PRGRES  02:45 PM        18-JUN-74
1000 ØN ERRØR GØ TØ 6000
1010 PRINT: PRINT: PRINT
1020 PRINT "         PRØGRESS  REPØRT   -   "; DATE$(0)
1030 PRINT
1040 PRINT "       STUDENT        MØDULE    STARTED     FINISHED"
1050 PRINT
1060 ØPEN "STUDNT" FØR INPUT AS FILE 1, MØDE 1
1070 DIM #1, N$(400,2)
1080 N=VAL(N$(0,0))
1090 FØR J=1 TØ N
1100 ØPEN N$(J,2) FØR INPUT AS FILE 2, MØDE 1
1110 DIM #2, P%(20), D%(20), S%(30), D1%(30), D2%(30), C1(30),
          L%( 2), E%(30), T%(1,120)
1120 IF P%(0)>0 THEN 1150
1130 PRINT J; N$(J,0)
1140 GØ TØ 1330
1150 IF S%(0)>0 THEN 1180
1155 K=1
1160 PRINT J;N$(J,0);TAB(21);P%(K)
1170 GØ TØ 1330
1180 K=S%(0)
1190 IF D2%(K)>0 THEN 1250
1200 X8%=D1%(K)
1210 GØSUB 7000
1220 Z1=Y2%: Z2$=MID(X1$,Z-3,3): Z3=Y1%
1230 PRINT J;N$(J,0);TAB(21);S%(K);TAB(29);Z1;Z2$;Z3
1240 GØ TØ 1330
1250 K=S%(0)
1260 X8%=D1%(K)
1270 GØSUB 7000
1280 Z1=Y2%: Z2$=MID(X1$,Z-3,3): Z3=Y1%
1290 X8%=D2%(K)
1300 GØSUB 7000
1310 Z4=Y2%: Z5$=MID(X1$,Z-3,3): Z6=Y1%
1320 PRINT J;N$(J,0);TAB(21);S%(K);TAB(29);Z1;Z2$;Z3,
     TAB(41);Z4;Z5$;Z6
1330 CLØSE 2
1340 NEXT J
1350 GØ TØ 9990
6000 IF ERR<>19 THEN ØN ERRØR GØ TØ 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
7000 X1$="JANFEBMARAPRMAYJUNJULAUGSEPØCTNØVDEC"
7010 X2$="000031059090120151181212243273304334"
7030 Y2%=X8%: Y1%=(Y2%-1)/365+74
7040 IF Y2%<366 THEN 7060
7050 Y2%=Y2%-365: GØ TØ 7040
7060 FØR Z=1 TØ 39 STEP 3
7070 IF Y2%<=VAL(MID(X2$,Z,3)) THEN 7090
7080 NEXT Z
7090 Y2%=Y2%-VAL(MID(X2$,Z-3,3))
8000 RETURN
9990 CLØSE 1
9999 END                                F-22

READY
```

```
SKILLS  02:57 PM        18-JUN-74
1000 ØN ERRØR GØ TØ 5000
1010 ØPEN "SKLFIL" FØR INPUT AS FILE 3, MØDE 1
1020 DIM #3, F%(30), F$(30)=64
1030 N=F%(0)
1040 PRINT "TØ ENTER A NEW SKILL TYPE (NEW)"
1050 PRINT "TØ DELETE AN ØLD SKILL TYPE (DELETE)"
1060 INPUT "ØTHERWISE (LIST)"; R$
1070 IF R$="DELETE" THEN 1310
1080 IF R$="NEW" THEN 1100
1090 GØ TØ 4000
1100 INPUT "NEW SKILL NUMBER ="; N%
1110 PRINT "CØNFIRM"; N%
1120 INPUT "TYPE Y ØR N"; N$
1130 IF N$<>"Y" THEN 1100
1140 FØR J=1 TØ N
1150 IF N%<F%(J) THEN 1220
1160 IF N%>F%(J) THEN 1190
1170 PRINT "SØRRY - BUT THAT SKILL ALREADY EXISTS."
1180 GØ TØ 9990
1190 NEXT J
1200 J1=N+1
1210 GØ TØ 1250
1220 FØR J1=N TØ J STEP -1
1230 F$(J1+1)=F$(J1): F%(J1+1)=F%(J1)
1240 NEXT J1
1250 F%(J1)=N%
1260 PRINT "SKILL DESCRIPTIØN IS"
1265 INPUT F$(J1)
1270 N=N+1
1280 INPUT "TØ ENTER ANØTHER SKILL TYPE Y ELSE N"; N$
1290 IF N$<>"Y" THEN 4000
1300 GØ TØ 1100
1310 INPUT "SKILL NUMBER TØ BE DELETED IS"; N%
1320 PRINT "CØNFIRM"; N%
1325 INPUT "TYPE Y ØR N"; N$
1330 IF N$<>"Y" THEN 1310
1340 FØR J=1 TØ N
1350 IF N%=F%(J) THEN 1390
1360 NEXT J
1370 PRINT "SØRRY - THAT SKILL DØES NØT EXIST"
1380 GØ TØ 9990
1390 FØR J1=J TØ N
1400 F$(J1)=F$(J1+1): F%(J1)=F%(J1+1)
1410 NEXT J1
1420 N=N-1
1430 PRINT "SKILL # "; N%; "HAS BEEN DELETED"
1440 INPUT "TØ DELETE ANØTHER SKILL TYPE Y ELSE N"; N$
1450 IF N$="Y" THEN 1310
4010 PRINT "CURRENT LIST ØF SKILLS", DATE$(0): PRINT
4030 FØR J=1 TØ N: PRINT F%(J); F$(J): NEXT J: PRINT: PRINT
4060 GØ TØ 9990
5000 IF ERR<>19 THEN ØN ERRØR GØ TØ 0
5010 PRINT "WAITING": SLEEP 10
5020 RESUME
9990 F%(0)=N: CLØSE 3
9999 END

READY
```

APPENDIX G

MODULE FORMAT

Information describing each module of instruction is to be organized according to the following form to be entered into the computer.

1. NUMBER - _____

   This is any integer less than 30000 and will be used by the system to identify and order the modules.

2. NAME - - - - - - - - - - - - - - - - - _____

   This is any phrase less than 33 characters in length used to name the moudle and will be used to describe the moudle on output lists.

3. SIZE - _____

   This is any real number used to indicate the amount of material covered in the module. (possibly the percentage of credit the module is worth)

4. PREREQUISITE MODULES - - - - - - - - - - - - - _____

   This is a list of not more than three module numbers of the modules considered prerequisite to this module. Entry modules or 'stand alone' modules would have no prerequisite modules.

5. PRETEST NUMBERS - - - - - - _____

   Mode A: This is a list of not more than ten integer numbers identifying the particular skills needed to perform the learning activities in this module. An activities prescription will be output upon demonstration of those skills.

   Mode B: This is a list of not more than ten integer numbers identifying those pretest items which test the objective(s) in this module. Satisfactory completion of those items on the pretest will permit bypassing this module for credit. (no activities prescription will be output)

6. DATE - _____

7. DAYS - _____

This is the availability of the module. Learning activities will not be available before this date and must be completed within the specified number of days.

8. OBJECTIVE(S) -

The objective(s) text will not be entered in the computer but will be given to all students in a printed study guide. There is no limit to the number of objectives for each module.

9. LEARNING ACTIVITIES -

The learning activities (maximum of 50) are designed to provide various modes of instruction and are keyed to the objective(s) and briefly described as follows:

NUMBER - - - - - - - - - - - - - - - _____

This is a 2 or more digit number in which the left hand digits are the same as the objective it references.

STYLE 1 - - - - - - - - - - - - - - - - - _____

STYLE 2 - - - - - - - - - - - - - - - - - _____

The style numbers are integers relating this activity to particular learning styles. (see special instructions for determining these numbers)

ACTIVITY -

This is any sentence less than 65 characters in length which states the activity to be performed.

APPENDIX H

AVAILABLE MODULES FOR PHYSICS 221

NBR		SIZE	PREQ MOD	PRETEST ITEMS	AVAILABLE DATE	AVAILABLE DAYS
105	Metric Measurement & Data Analyse	.2	none	210, 221	Aug. 26	14
110	Linear Motion & Trajectories	.5	none	210, 221, 222, 224 231, 232	Aug. 26	21
115	Vectors and Forces	.4	none	210, 221, 222, 224 232, 242, 243, 244	Aug. 26	21
120	Forces, Motion & Work (friction)	.4	110, 115		Sept. 2	21
125	Energy and Momentum	.6	120		Sept. 9	21
130	Circular and Rotational Motion	.5	120, 125	241	Sept. 16	21
135	Properties of Materials	.6	120		Sept. 23	28
150	Electrical Phenomena	.2	none	210, 221	Oct. 7	28
160	Electrostatic fields	.4	125, 150		Oct. 7	28
165	Potential, Current & Power	.4	160		Oct. 14	28
170	Electromagnetism & EMF	.5	165		Oct. 21	28
175	Electrical Measurements	.4	170		Oct. 28	28
180	Electrical Properties of Materials & Devices	.3	170		Nov. 4	28
185	A.C.	.3	170		Nov. 11	28

APPENDIX I

Module #125 Energy and Momentum

OBJECTIVES:

1. State or identify a precise definition of potential energy. The concept of 'work' as defined in physics is to be used in that definition. Also identify (kg m^2/sec^2), (nt m) and (joules) as equivalent MKS units for potential energy.

2. Given the description of an object moving in a given force field, state whether the potential energy of that object is increasing, decreasing or remaining unchanged.

3. Calculate the change in potential energy of a body which is displaced from one point to another in the earths gravitational force field. (At the surface of the earth, the earth's field exerts a force of 9.8 nt toward the center of the earth's on each kilogram of mass.)

4. Given information concerning the properties of a spring (how much force is required to compress that spring a given distance), construct a graph of force versus compression and determine the potential energy of the spring when it is compressed a given distance.

5. State or identify a precise definition of kinetic energy. Also state or identify the precise functional relationship between the kinetic energy and the velocity of an object.

6. Apply the principle of conservation of energy to calculate each of the following:

   a) the speed an object has after falling from a given height.
   b) the speed an object has after being fired from a spring gun

   In each case you will be given the mass of the object, the geometric dimensions of the system and enough information to fully define the force.

7. Given a description of a frictionless system such as a roller coaster, car coasting on a hill or a cyclest on a loop-the-loop:

apply the principle of conservation of energy to predict maximum heights and/or velocities of the object when given the initial total energy of the object.

8. State or identify a definition of 'power', and recognize the units (joules/sec) and (watts) as equivalent MKS units of power.

9. Given the power output of some device, calculate how high that device can lift an object in a given time.

10. State or select a written definition of momentum and state or select a correct phrase describing the functional relationship between momentum and velocity. Also identify (ig m/sec) as correct MKS units for momentum.

11. Given a description of an explosion type system (rifle recoil and buttet) or a simple inelastic collision type system (bullet hits block of wood); use the principle of conservation of momentum to find an unknown mass of velocity when given all other masses and velocities.

12. State or select a definition of impluse and show how Newton's second law of motion (F-ma) implies that the impulse ($F\Delta t$) imparted to an object is equivalent to the change in momentum ($m\Delta v$) of that object.

13. Find the impluse imparted to an object when given a graph of the force applied to the object as a function of the time it was applied.

14. Find the average force involved in firing a projectile at a given speed when given the mass of the projectile and the time during which the force acts.

15. Find the average force involed in firing a projectile a given distance. Information to be given will include the geometric dimensions of the device, the angle of elevation and the mass of the projectile. (Evaluation of this objective will include questions concerning all steps of the solution.)

ACTIVITIES - 125

NBR	STYLES	DESCRIPTION
011	(36,35)	Taped Minilecture: "PE-Qualitative Discussion"
012	(37,31)	Supplemental Read: PSSC-p 300 sec 17-1, 17-2
013	(35,32)	Textbook Reading: p 80 sec 7.1-7.2, p 84 sec 7.5
021	(36,31)	Supplemental Read: Freeman-p 199 sec. 9.5-9.6
031	(38,35)	Tape Guided Lesson: "PE-Quantitative Analysis"
032	(35,32)	Textbook Reading: p 83 sec 7.5
033	(37,34)	Textbook Problems: p 93 #27, 28
041	(36,31)	Supplemental Read: PSSC- p 320 sec 18-1
051	(37,35)	Taped Minilecture: "KE and Newton's Law"
061	(38,34)	Film Loop: "Conversation of Energy"
062	(36,31)	Supplemental Read: PSSC-p 320 sec 18-1
063	(35,32)	Textbook Reading: p 82 sec 7.5-7.6
064	(37,34)	Textbook Problems: p 93 #26, 27, 28
071	(40,32)	Narrated Demonstr: "The Roller Coaster"
081	(36,31)	Supplemental Read: Freeman-p 209 sec 9.13
082	(37,32)	Textbook Reading: p 81 sec 7.3
091	(35,34)	Textbook Problems: p 93 #32
101	(36,32)	Textbook Reading: p 95 sec 8.1
111	(39,35)	Narrated Lab Act: "Muzzle Velocity of a Rifle"
112	(40,34)	Demonstration: "Recoil Velocity"
113	(36,32)	Textbook Reading: p 96 sec 8.2, 8.6
114	(37,34)	Textbook Problems: p 105 #4, 5, 19, 20
141	(37,32)	Textbook Reading: top p 96
142	(37,34)	Textbook Problem: p 105 #6, 7
151	(35,35)	Taped Minilecture: "Forces to Propel Projectiles

Note: The first two digits of the activity number correspond to the number of the objective to which that activity relates.

PROPOSED LIST OF LEARNING ACTIVITIES

1. Textbook Reading:
   a. Reading assignments selected from the textbook.

2. Supplemental Reading:
   a. Any reading assignment outside of the textbook.
   b. Available in the learning center or library as indicated in the activity. (LC, Lib, Lib Res, etc.)

3. Minilecture:
   a. Any taped discussion not involving lab apparatus.
   b. Available at the learning center desk with supplemental printed information.

4. Demonstration:
   a. Any piece(s) of lab or demonstration equipment available with short printed instructions on how to use and what to observe.
   b. Available in the learning center under an appropriate standardized sign. (possibly a list of currently available demonstrations can be maintained on the bulletin board)

5. Narrated Demonstration:
   a. Same as 'Demonstration' except a tape player with an appropriate tape would be included with the equipment at the demonstration site.

6. Film Loop:
   a. Single concept films and film loops.
   b. To be checked out from the learning center desk and used in projectors located in the learning center.

7. Narrated Film Loops:
   a. Same as 'Film Loop' except an audio tape would be attached to the cassette to be used in a player located by the projectors.

8. Printed Lab Activity:
    a. Any lab activity in which printed information is used to guide the student through a process of data taking and data analysis.
    b. The printed information is to be picked up at the learning center desk and the lab equipment will be set up in the learning center under an appropriate sign.

9. Narrated Lab Activity:
    a. Same as 'Printed Lab Activity' except an audio tape would be used to guide the student through a process of data taking and data analysis.
    b. The tape would be available to be checked out at the learning center desk and used with the designated lab equipment.

10. Exhibit:
    a. Any poster, pieces of equipment, etc. used to illustrate specific ideas or problems.
    b. Placed in appropriate positions around the learning center or display case. (possibly a list of currently available exhibits can be maintained on the bulletin board)

11. Special Problems:
    a. Any specially prepared printed problem.
    b. Available at the learning center desk or placed where students can pick them up.

12. Textbook Problems:
    a. Any problem selected from the textbook.

13. Group Discussion:
    a. There will be groups of students meeting to discuss this topic. Add your name to a sign-up sheet or find another interested student and post a new sign-up sheet.

14. Computer Assisted:
    a. Go to any available computer terminal. You will receive instructions when you have typed RUN(41,99). Always bring pencil and scratch paper when you go for this type of lesson.

15. Instructor Conference:
    a. You should meet with your own instructor at this time. Please tell him that you are at a part of your lesson that calls for activity number XXXX.

16. Demonstration-Lecture:

APPENDIX J

Use of Learning Styles to Prescribe Learning Activities

Background

The following information is taken from the summary of the final report on Phase I of the learning styles project prepared by John Banks.

> This project was jointly proposed and submitted by Fox Valley Technical Institute, District 12, and the Center for Vocational, Technical and Adult Education at the University of Wisconsin - Stout to the Wisconsin Board of Vocational, Technical and Adult Education. The project was undertaken to investigate the interaction of learning styles and types of learning experiences provided to students in vocational-technical education.
>
> In June of 1972 the original project was funded by the Wisconsin Board of Vocational, Technical and Adult Education. In the fall of 1972 the University of Wisconsin - Stout submitted a sub-proposal to the Fox Valley Technical Institute to identify a sub-set of learning styles and to determine their relationship with the acquisition of technical skills and knowledges.
>
> This study specifically identified two learning style continuums relevant to vocational and technical education programs. These two continuums were labeled as (1) concrete/symbolic and (2) structured/unstructured. To measure these continuums two instruments were originally developed, a semantic differential and a Likert scale. The pilot instruments were administered at the Fox Valley Technical Institute. Based on data gathered from the instruments, an individual was placed somewhere along each of the continuums. The relative position on a continuum determined the extent the individual was influenced by a particular learning style. An individual who located near the continuum midpoint would be affected by a composite of the continuum learning styles. A position near a continuum end was determined to show the individual as being highly affected by that style.

Phase II

This phase of the learning styles project deals with the problem of utilizing students' learning styles to prescribe individual learning

styles to prescribe individual learning activities. A student highly affected by a particular learning style would prefer to achieve the course objectives through those activities which most closely match his style of learning. This requires an individualized environment in which each student may engage in a unique set of learning activities.

A computerized system for providing student with a set of activities which most closely correlates with their styles of learning has been constructed. To achieve this matching of activities with students requires the input of "styles" information on both student and activities.

Student Information

The two learning style continuums identified by John Banks will be used in Phase II. Also, the learning style opinionnaire constructed and tested by Banks will be used to place each student along the continuum of the two styles. The opinionnaire will be administered on the opening day of classes and the information which consists of two numbers/student entered into the system through a terminal. If an electronic device is used for summarizing the papers, the styles for a few hundred students can be entered into their personal records in a few hours.

Activity Information (for the physics project)

The learning styles opinionnaire was administered to 93 students enrolled in Physics 223 in the Fall semester 1973. The results are as follows:

symbolic	11	ave = 37	s = 3.4	55	concrete
unstructured	11	ave = 33	s = 4.2	55	structured

These data will be used to arbitrarily associate each proposed learning activity in the basic physics modules with a point on each of the two style continuums.

The activities will then be ranked according to the degree to which they correspond with the student styles and presented in that order. The first activity associated with each objective will then be the activity which most closely matches the students prefered styles of learning.

APPENDIX K

INFORMATION TO STUDENTS

This is a description of the procedures you must follow to select a course of study and become enrolled with the Computer Managed Instructional System. Each step outlined below must be followed in the sequence in which it is presented.

I. Pretest and Learning Styles Questionnaire

1. Pretest--This test will be administered on the first day of class and the results will be entered into your record.

2. Learning Styles Questionnaire - this is a short questionnaire which is designed to provide information concerning your preferred modes of learning. The results of this questionnaire will also become part of your record and will be used later to provide individualized learning prescriptions.

II. Constructing Your Program

A list of available modules are attached to this information sheet. You are to select those modules which you want to be included in your program of study. Pay particular attention to prerequisite requirements and availability dates so your program and planned dates of starting each module do not conflict with the given information.

Select your program and write the module numbers and expected starting dates below:

Module Nbr	Expected Starting Date Month	Day
_____	_____	____
_____	_____	____
_____	_____	____
_____	_____	____
_____	_____	____
_____	_____	____
_____	_____	____
_____	_____	____
_____	_____	____
_____	_____	____

```
1-ENROLL, 2-PROGRM, 3-PGMLST, 4-STATUS, 5-NXTMOD, 6-TESTER

? 1
WAIT
PLEASE TYPE YOUR LAST NAME FIRST
THEN SPACE AND FIRST NAME? HILGENDORF AL
CONFIRM HILGENDORF AL
TYPE Y OR N? Y
PLEASE TYPE YOUR ID-NUMBER? 123-45-6789
CONFIRM 123-45-6789
TYPE Y OR N? Y
ENROLLMENT OF HILGENDORF AL IS COMPLETE
WAIT


1-ENROLL, 2-PROGRM, 3-PGMLST, 4-STATUS, 5-NXTMOD, 6-TESTER

? 2
NAME PLEASE? HILH
SORRY - BUT I CAN'T FIND YOUR NAME ON THE CLASS LIST.
PLEASE USE THE SAME NAME UNDER WHICH YOU ENROLLED
OR TRY ENTERING YOUR LAST NAME ONLY.
NAME PLEASE? HILG
CONFIRM HILGENDORF AL 123-45-6789
TYPE Y OR N? Y
WAIT
ENTER MODULE NUMBERS IN THE SEQUENCE IN WHICH YOU
PLAN TO COMPLETE THEM.  ALSO ENTER THE DATE YOU PLAN
TO START EACH MODULE.  LAST MODULE NUMBER SHOULD BE
ZERO TO TERMINATE PROGRAM ENTRY.

MODULE #? 110
STARTING MONTH-XXX? AUG
DAY? 30
MODULE #? 115
STARTING MONTH-XXX? AUG
DAY? 30
MODULE #? 120
STARTING MONTH-XXX? SEP
DAY? 15
MODULE #? 125
STARTING MONTH-XXX? SEP
DAY? 30
STARTING DATE OUTSIDE MODULE AVAILABILITY - TRY AGAIN.
STARTING MONTH-XXX? SEP
DAY? 25
MODULE #? 0
PROGRAM ENTRY IS COMPLETE
WAIT


1-ENROLL, 2-PROGRM, 3-PGMLST, 4-STATUS, 5-NXTMOD, 6-TESTER

?
```

```
RUN MAINST


1-ENROLL, 2-PROGRM, 3-PGMLST, 4-STATUS, 5-NXTMOD, 6-TESTER

? 3
NAME PLEASE? A STU
CONFIRM A STUDENT
TYPE Y OR N? Y
WAIT


CURRENT PROGRAM
A STUDENT
27-APR-74

NUMBER          MODULE DESCRIPTION              SIZE      STARTING DATE

  110     LINEAR MOTION & TRAJECTORIES           .5        30 AUG 74
  115     VECTORS AND FORCES                     .4        5 SEP 74
  120     FORCES - MOTION & WORK                 .4        10 SEP 74
  125     ENERGY AND MOMENTUM                    .6        20 SEP 74
  130     CIRCULAR AND ROTATIONAL MOTION         .5        25 SEP 74
  150     ELECTRICAL PHENOMENA                   .2        7 OCT 74
  160     ELECTROSTATIC FIELDS                   .4        15 OCT 74



1-ENROLL, 2-PROGRM, 3-PGMLST, 4-STATUS, 5-NXTMOD, 6-TESTER

? 4
NAME PLEASE? A ST
CONFIRM A STUDENT
TYPE Y OR N? Y
WAIT


STATUS OF A STUDENT                    27-APR-74

MODULE     STARTED     FINISHED    LEVEL   SIZE

  110   22 APR 74   22 APR 74      85      .5
  115   23 APR 74   24 APR 74      82      .4
  120   24 APR 74   24 APR 74      85      .4
  125   25 APR 74



1-ENROLL, 2-PROGRM, 3-PGMLST, 4-STATUS, 5-NXTMOD, 6-TESTER

?
```

APPENDIX L

```
WAIT
WAIT


LEARNING ACTIVITIES PRESCRIPTIØN FØR:  A STUDENT
 37  26
MØDULE # 125 ENERGY AND MØMENTUM        25-APR-74

ØBJ                          ACTIVITY
 1
    2 SUPPLEMENTAL READ:   PSSC-P 300 SEC 17-1, 17-2
    3 TEXTBØØK READING:    P 80 SEC 7.1-7.1, P 84 SEC 7.5
    1 TAPED MINILECTURE:   "PE-QUALITATIVE DISCUSSIØN"
 2
    1 SUPPLEMENTAL READ:   FREEMAN-P 199 SEC. 9.5-9.6
 3
    2 TEXTBØØK READING:    P 83 SEC 7.5
    3 TEXTBØØK PRØBLEMS:   P 93 #27, 28
    1 TAPE GUIDED LESSØN:  "PE-QUANTITATIVE ANALYSIS"
 4
    1 SUPPLEMENTAL READ:   PSSC- P 320 SEC 18-1
 5
    1 TAPED MINILECTURE:   "KE AND NEWTØN'S LAW"
 6
    2 SUPPLEMENTAL READ:   PSSC-P 320 SEC 18-1
    3 TEXTBØØK READING:    P 82 SEC 7.5-7.6
    1 FILM LØØP:           "CØNSERVATIØN ØF ENERGY"
    4 TEXTBØØK PRØBLEMS:   P 93 #26, 27, 28
 7
    1 NARRATED DEMØNSTR:   "THE RØLLER CØASTER"
 8
    1 SUPPLEMENTAL READ:   FREEMAN-P 209 SEC 9.13
    2 TEXTBØØK READING:    P 81 SEC 7.3
 9
    1 TEXTBØØK PRØBLEMS:   P 93 #32
 10
    1 TEXTBØØK READING:    P 95 SEC 8.1
 11
    3 TEXTBØØK READING:    P 96 SEC 8.2, 8.6
    2 DEMØNSTRATIØN:       "RECØIL VELØCITY"
    4 TEXTBØØK PRØBLEMS:   P 105 #4, 5, 19, 20
    1 NARRATED LAB ACT:    "MUZZLE VELØCITY ØF A RIFLE"
 14
    1 TEXTBØØK READING:    TØP P 96
    2 TEXTBØØK PRØBLEM:    P 105 #6, 7
 15
    1 TAPED MINILECTURE:   "FØRCES TØ PRØPEL PRØJECTILES"


1-ENRØLL, 2-PRØGRM, 3-PGMLST, 4-STATUS, 5-NXTMØD, 6-TESTER

?
```

```
WAIT
WAIT


LEARNING ACTIVITIES PRESCRIPTIØN FØR:  A STUDENT
 27  35
MØDULE # 125 ENERGY AND MØMENTUM          25-APR-74

ØBJ                              ACTIVITY
 1
    1 TAPED MINILECTURE:   "PE-QUALITATIVE DISCUSSIØN"
    3 TEXTBØØK READING:    P 80 SEC 7.1-7.1, P 84 SEC 7.5
    2 SUPPLEMENTAL READ:   PSSC-P 300 SEC 17-1, 17-2
 2
    1 SUPPLEMENTAL READ:   FREEMAN-P 199 SEC. 9.5-9.6
 3
    2 TEXTBØØK READING:    P 83 SEC 7.5
    3 TEXTBØØK PRØBLEMS:   P 93 #27, 28
    1 TAPE GUIDED LESSØN:  "PE-QUANTITATIVE ANALYSIS"
 4
    1 SUPPLEMENTAL READ:   PSSC- P 320 SEC 18-1
 5
    1 TAPED MINILECTURE:   "KE AND NEWTØN'S LAW"
 6
    3 TEXTBØØK READING:    P 82 SEC 7.5-7.6
    4 TEXTBØØK PRØBLEMS:   P 93 #26, 27, 28
    2 SUPPLEMENTAL READ:   PSSC-P 320 SEC 18-1
    1 FILM LØØP:           "CØNSERVATIØN ØF ENERGY"
 7
    1 NARRATED DEMØNSTR:   "THE RØLLER CØASTER"
 8
    1 SUPPLEMENTAL READ:   FREEMAN-P 209 SEC 9.13
    2 TEXTPØØK READING:    P 81 SEC 7.3
 9
    1 TEXTBØØK PRØBLEMS:   P 93 #32
 10
    1 TEXTBØØK READING:    P 95 SEC 8.1
 11
    3 TEXTBØØK READING:    P 96 SEC 8.2, 8.6
    4 TEXTBØØK PRØBLEMS:   P 105 #4, 5, 19, 20
    1 NARRATED LAB ACT:    "MUZZLE VELØCITY ØF A RIFLE"
    2 DEMØNSTRATIØN:       "RECOIL VELØCITY"
 14
    2 TEXTBØØK PRØBLEM:    P 105 #6, 7
    1 TEXTBØØK READING:    TØP P 96
 15
    1 TAPED MINILECTURE:   "FØRCES TØ PRØPEL PRØJECTILES"



1-ENRØLL, 2-PRØGRM, 3-PGMLST, 4-STATUS, 5-NXTMØD, 6-TESTER
```



```
?
```

APPENDIX M

```
RUN EXPUSE
ENTER MONTH(XXX) AND DAY(99) YOU WANT REPORT TO START
? AUG,26
```

EXPECTED MODULE ENTRY
- BY DATE -

DATE	- - - MODULE(NBR OF STUDENTS) - - -		
26 AUG 74	110 (3)	105 (3)	
2 SEP 74	115 (1)	110 (1)	
9 SEP 74	115 (4)	120 (2)	110 (1)
16 SEP 74	120 (3)	125 (1)	
23 SEP 74	125 (2)	130 (1)	135 (1)
30 SEP 74	135 (2)	130 (1)	
7 OCT 74	150 (3)	135 (1)	
14 OCT 74	160 (2)	150 (1)	
21 OCT 74			
28 OCT 74	165 (1)		
4 NOV 74	170 (1)		

```
READY
```

PROGRESS REPORT - 27-APR-74

	STUDENT	MODULE	STARTED	FINISHED
1	A STUDENT	125	25 APR 74	
2	B STUDENT	105	27 APR 74	27 APR 74
3	BLANK JIM	105		
4	C STUDENT			
5	GOOFER FRED	115	27 APR 74	
6	HILL A BIG	120	25 APR 74	25 APR 74
7	MORSS ROBERT	110	22 APR 74	24 APR 74

READY

```
RUN MODUSE


 CURRENT MODULE ACTIVITY - 27-APR-74

 MODULE   STUDENTS   STUDENTS   STUDENTS
 NUMBER   FINISHED    ACTIVE    EXPECTED

   105        2          0          1
   110        3          0          1
   115        1          1          1
   120        2          0          0
   125        0          1          1
   130        0          0          1
   135        0          0          0
   150        0          0          0
   160        0          0          0
   165        0          0          0
   170        0          0          0
   175        0          0          0
   180        0          0          0
   185        0          0          0

READY
```

MODULE SUMMARY - 27-APR-74

NBR	NAME	SIZE	AVAILABLE	DAYS
105	METRIC MEASUREMENT & DATA ANALYS P = 210 221	.2	26 AUG 74	14
110	LINEAR MOTION & TRAJECTORIES P = 210 221 222 224 231 232	.5	26 AUG 74	21
115	VECTORS AND FORCES P = 210 221 222 224 232 242 243 244	.4	26 AUG 74	21
120	FORCES - MOTION & WORK Q = 110 115	.4	2 SEP 74	21
125	ENERGY AND MOMENTUM Q = 120	.6	9 SEP 74	21
130	CIRCULAR AND ROTATIONAL MOTION Q = 120 125 P = 241	.5	16 SEP 74	21
135	PROPERTIES OF MATERIALS Q = 120	.6	23 SEP 74	28
150	ELECTRICAL PHENOMENA P = 210 221	.2	7 OCT 74	28
160	ELECTROSTATIC FIELDS Q = 125 150	.4	7 OCT 74	28
165	POTENTIAL - CURRENT & POWER Q = 160	.4	14 OCT 74	28
170	ELECTROMAGNETISM & EMF Q = 165	.5	21 OCT 74	28
175	ELECTRICAL MEASUREMENTS Q = 170	.4	28 OCT 74	28
180	ELECT PROP OF MATERIALS & DEVICE Q = 170	.3	4 NOV 74	28
185	A. C. Q = 170	.3	11 NOV 74	28

READY